

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
BROWNSVILLE DIVISION**

STATE OF TEXAS, *et al.*,

Plaintiffs

VS.

UNITED STATES OF AMERICA, *et al.*,

Defendants,

KARLA PEREZ, *et al.*,

Defendants-Intervenors.



CIVIL ACTION NO. 1:18-cv-00068

APPENDIX IN SUPPORT OF BRIEF OF 114 COMPANIES AND ASSOCIATIONS AS *AMICI CURIAE*

VOLUME 1

EXHIBITS 1-37

EXHIBIT 1

Secretary

U.S. Department of Homeland Security
Washington, DC 20528



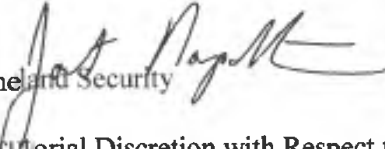
**Homeland
Security**

June 15, 2012

MEMORANDUM FOR: David V. Aguilar
Acting Commissioner, U.S. Customs and Border Protection

Alejandro Mayorkas
Director, U.S. Citizenship and Immigration Services

John Morton
Director, U.S. Immigration and Customs Enforcement

FROM: Janet Napolitano 
Secretary of Homeland Security

SUBJECT: Exercising Prosecutorial Discretion with Respect to Individuals
Who Came to the United States as Children

By this memorandum, I am setting forth how, in the exercise of our prosecutorial discretion, the Department of Homeland Security (DHS) should enforce the Nation's immigration laws against certain young people who were brought to this country as children and know only this country as home. As a general matter, these individuals lacked the intent to violate the law and our ongoing review of pending removal cases is already offering administrative closure to many of them. However, additional measures are necessary to ensure that our enforcement resources are not expended on these low priority cases but are instead appropriately focused on people who meet our enforcement priorities.

The following criteria should be satisfied before an individual is considered for an exercise of prosecutorial discretion pursuant to this memorandum:

- came to the United States under the age of sixteen;
- has continuously resided in the United States for a least five years preceding the date of this memorandum and is present in the United States on the date of this memorandum;
- is currently in school, has graduated from high school, has obtained a general education development certificate, or is an honorably discharged veteran of the Coast Guard or Armed Forces of the United States;
- has not been convicted of a felony offense, a significant misdemeanor offense, multiple misdemeanor offenses, or otherwise poses a threat to national security or public safety; and
- is not above the age of thirty.

Our Nation's immigration laws must be enforced in a strong and sensible manner. They are not designed to be blindly enforced without consideration given to the individual circumstances of each case. Nor are they designed to remove productive young people to countries where they may not have lived or even speak the language. Indeed, many of these young people have already contributed to our country in significant ways. Prosecutorial discretion, which is used in so many other areas, is especially justified here.

As part of this exercise of prosecutorial discretion, the above criteria are to be considered whether or not an individual is already in removal proceedings or subject to a final order of removal. No individual should receive deferred action under this memorandum unless they first pass a background check and requests for relief pursuant to this memorandum are to be decided on a case by case basis. DHS cannot provide any assurance that relief will be granted in all cases.

1. With respect to individuals who are encountered by U.S. Immigration and Customs Enforcement (ICE), U.S. Customs and Border Protection (CBP), or U.S. Citizenship and Immigration Services (USCIS):

- With respect to individuals who meet the above criteria, ICE and CBP should immediately exercise their discretion, on an individual basis, in order to prevent low priority individuals from being placed into removal proceedings or removed from the United States.
- USCIS is instructed to implement this memorandum consistent with its existing guidance regarding the issuance of notices to appear.

2. With respect to individuals who are in removal proceedings but not yet subject to a final order of removal, and who meet the above criteria:

- ICE should exercise prosecutorial discretion, on an individual basis, for individuals who meet the above criteria by deferring action for a period of two years, subject to renewal, in order to prevent low priority individuals from being removed from the United States.
- ICE is instructed to use its Office of the Public Advocate to permit individuals who believe they meet the above criteria to identify themselves through a clear and efficient process.
- ICE is directed to begin implementing this process within 60 days of the date of this memorandum.
- ICE is also instructed to immediately begin the process of deferring action against individuals who meet the above criteria whose cases have already been identified through the ongoing review of pending cases before the Executive Office for Immigration Review.

3. With respect to the individuals who are not currently in removal proceedings and meet the above criteria, and pass a background check:

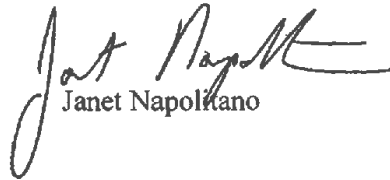
- USCIS should establish a clear and efficient process for exercising prosecutorial discretion, on an individual basis, by deferring action against individuals who meet the

above criteria and are at least 15 years old, for a period of two years, subject to renewal, in order to prevent low priority individuals from being placed into removal proceedings or removed from the United States.

- The USCIS process shall also be available to individuals subject to a final order of removal regardless of their age.
- USCIS is directed to begin implementing this process within 60 days of the date of this memorandum.

For individuals who are granted deferred action by either ICE or USCIS, USCIS shall accept applications to determine whether these individuals qualify for work authorization during this period of deferred action.

This memorandum confers no substantive right, immigration status or pathway to citizenship. Only the Congress, acting through its legislative authority, can confer these rights. It remains for the executive branch, however, to set forth policy for the exercise of discretion within the framework of the existing law. I have done so here.



Janet Napolitano

EXHIBIT 2



Entrepreneurship

REPORT OCTOBER, 2016

Reason FOR REFORM:

Entrepreneurship



Reason for Reform: Entrepreneurship

CONTENTS

Executive Summary.....	1
I. Overview of Immigrant Entrepreneurship.....	3
II. The Role of Immigrants and Their Children in the 2016 Fortune 500	6
III. The Employment Impact of Private Firms.....	9
IV. Punching Above Their Weight Class as Entrepreneurs.....	12
V. Entrepreneurship Within Immigrant Subgroups.....	13
VI. The Challenges Our Immigration System Poses to Entrepreneurs.....	15
Conclusion.....	18
Endnotes.....	19

Executive Summary

When it comes to the health of our economy, it is hard to overstate the importance of entrepreneurship. In the last three decades, companies less than five years old have created an average of 1.5 million new jobs for Americans each year.¹ Researchers have also found that between 1977 and 2005 almost all the net job creation in the United States was attributable to young firms.² Given this—and our country’s continued interest in tackling the low workforce participation rates and high underemployment that has persisted since the Great Recession—understanding what drives the formation of new and promising companies is of particular interest to policymakers. And it is increasingly clear that it is impossible to look at this issue without focusing closely on one group: The 34.2 million working-age immigrants currently living in America.³

Given that the act of picking up and moving to another country is inherently brave and risky, it comes as no surprise that immigrants have repeatedly been found to be more entrepreneurial than the U.S. population as a whole.⁴ According to The Kauffman Foundation, a nonprofit group that studies entrepreneurship, immigrants were almost twice as likely as the native-born population to start a new business in 2015.⁵ The companies founded by immigrants range from small businesses on Main Street to large firms responsible for thousands of American jobs. Recent studies have indicated that immigrants own more than half of the country’s grocery stores and 48 percent of nail salons.⁶ Foreign-born entrepreneurs are estimated to be behind 51 percent of our country’s billion dollar startups as well.⁷

In this report, we analyze data from the American Community Survey, The Survey of Small Business Owners, and other publicly available data sources to gain a fuller picture of the real and meaningful role

immigrants have played founding American companies in recent years. Building on past NAE research, we also document—for the first time—the share of firms on the 2016 Fortune 500 list that had at least one founder who was either an immigrant or the child of immigrants. Our findings indicate that foreign-born workers remain a critical piece of the U.S. entrepreneurship landscape. Firms owned by new Americans generate billions of dollars in business income each year, and provide jobs to millions of U.S. workers.

Immigrants were almost twice as likely as the native-born population to **start a new business** in 2015.

This report shows why it is critically important that Congress take action to better support immigrant entrepreneurs next year. For the second straight year in a row, the rate of new business formation has slowed in the United States overall—a worrying trend given how much new businesses help spur job creation, productivity increases, and economic growth overall.⁸ In this environment, immigrants continue founding companies at higher rates than the national average. Despite their many contributions, however, many foreign-born entrepreneurs struggle to remain in the United States under current immigration laws. In this report, we discuss some of the visa challenges faced by immigrant entrepreneurs and recent efforts the White House has taken to try to address them. For the continued health of the U.S. economy, it is clear such efforts must be continued—and amplified—in the coming years

KEY FINDINGS

- Immigrants in the United States play an **outsized role** as entrepreneurs.

The United States is currently home to more than 2.9 million foreign-born entrepreneurs, a group whose companies generated **\$65.5 billion** in business income in 2014 alone. Foreign-born residents frequently punch above their weight class as business owners: In 2014, immigrants made up 20.6 percent of all entrepreneurs in the country, despite representing 13.2 percent of the U.S. population overall.

- Foreign-born business owners have **created millions of American jobs**.

Even when excluding large, publicly traded firms, businesses owned by immigrants employed more than 5.9 million workers in 2007, the most recent year for which figures are available. In some states, the employment impact of immigrants was particularly pronounced: Almost 1.5 million California residents had jobs at immigrant owned firms in 2007, as did more than half a million Floridians. In 16 states—including Arizona, North Carolina, and Texas—more than **100,000** people were employed at companies with immigrant owners.

- Consistent with past research, a significant portion of firms on the most recent **Fortune 500** list were founded by immigrants or their children.

In 2016, **40.2** percent of Fortune 500 firms had at least one founder who either immigrated to the United States or was the child of immigrants. Those firms generated more than **\$4.8 trillion** in revenue in 2014 and employed **18.9 million** people globally.

- Some immigrant subgroups boast **particularly high rates** of entrepreneurship.

In 2014, **19.1** percent of immigrants from the Middle East and North Africa were entrepreneurs. Similarly, **11.1** percent of foreign-born Hispanics were self-employed, as were **10.6** percent of Asian immigrants. The national rate of entrepreneurship among working Americans was 9.5 percent that year.

- Foreign-born entrepreneurs were instrumental in the country's **recovery from the Great Recession**.

Between 2007 and 2011, a period when the country struggled to create new jobs, immigrant entrepreneurs played a large role founding new businesses in several key states. Foreign-born entrepreneurs started **44.6** percent of new businesses in California during that period, as well as **42.0** percent of new businesses in New York State.

PART I

Overview of Immigrant Entrepreneurship

Shan-Lyn Ma, the co-founder and CEO of Zola, the wedding registry giant, didn't come to the United States as an entrepreneur—she came to study at Stanford University. In 2004, Ma, who was born in Singapore but raised in Australia, enrolled Stanford's MBA program. After graduating, she initially took a traditional path, working for two years at Yahoo!. Craving a startup experience, she then moved to the Gilt Groupe, where she created and served as general manager of Gilt Taste, an arm of the site that sold gourmet wine and food to consumers. It gave her the skill set she needed to branch out on her own. "I finally had the experience under my belt," Ma says, "to take the plunge."

Inspiration came when many of Ma's friends started getting married. "I was going to a lot of weddings and all the newlyweds expressed a frustration with the classic gift registry system," she explains. "They would say: 'I loved my wedding but I hated my registry.'" So, in 2013, Ma, along with Kevin Ryan and Nobu Nakaguchi, founded Zola, a company that would "transform wedding registries from the most frustrating part of wedding planning to the most enjoyable aspect." Geared toward tech-savvy millennials, Zola offers a mobile app that allows couples to build customized registries with ease. And, unlike traditional wedding registries, Zola allows wedding guests to gift experiences, like a hot-air balloon ride or a winery tour, as well as cash for down payments or other expenses.

Zola has been wildly successful. The New-York-City-based company has raised over \$16 million in venture capital funding and is the fastest-growing wedding registry company in the United States. It also grossed \$40 million in 2015. In the last two and a half years,

the team has grown from three co-founders to 40 employees—38 of whom are American-born.

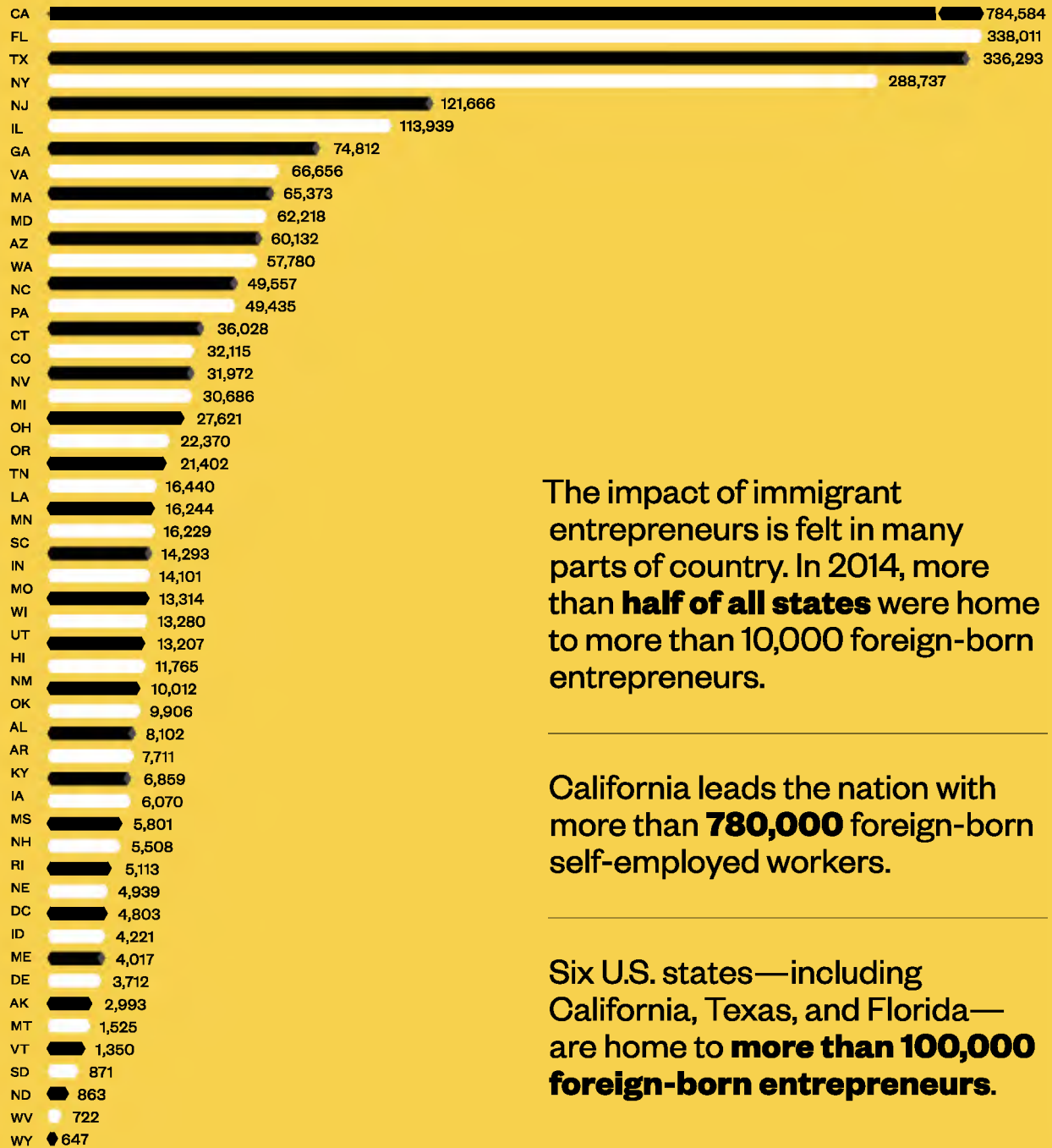
2,896,005

immigrants in the United States are self-employed.

Ma has built a firm that stands out for the incredibly rapid growth it has experienced in recent years. Ma, however, is just one of millions of foreign-born entrepreneurs currently in the United States—and one of many providing valuable jobs and opportunity to her fellow American workers. NAE's analysis of American Community Survey data finds that the United States was home to almost 2.9 million immigrant entrepreneurs in 2014. These individuals generated \$65.5 billion in business income that year.

The contributions such entrepreneurs make are felt in many parts of the country. In Figure 1, we highlight the number of immigrant entrepreneurs in each state as well as Washington, D.C. California leads the nation with more than 780,000 foreign-born self-employed workers. Five other states—including Texas, Florida, and Illinois—are home to more than 100,000 foreign-born entrepreneurs. Even states with relatively small populations of immigrants still have meaningful numbers of foreign-born entrepreneurs. Missouri and Indiana, for instance, have more than 14,000 foreign-born entrepreneurs. North Carolina and Pennsylvania both have almost 50,000.

FIGURE 1: NUMBER OF IMMIGRANT ENTREPRENEURS BY STATE, 2014

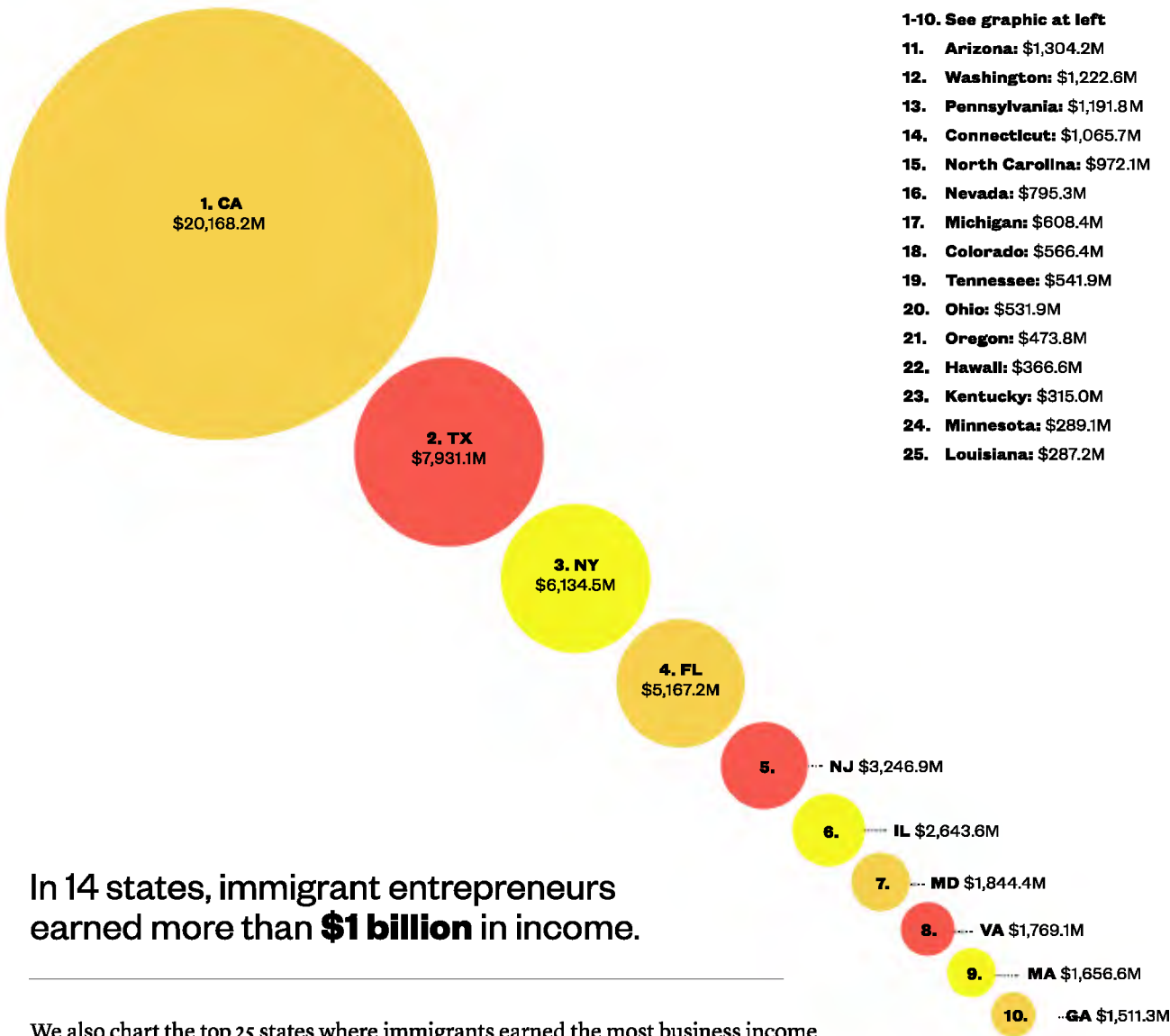


The impact of immigrant entrepreneurs is felt in many parts of country. In 2014, more than **half of all states** were home to more than 10,000 foreign-born entrepreneurs.

California leads the nation with more than **780,000** foreign-born self-employed workers.

Six U.S. states—including California, Texas, and Florida—are home to **more than 100,000 foreign-born entrepreneurs**.

FIGURE 2: BUSINESS INCOME OF FOREIGN-BORN ENTREPRENEURS, BY STATE, 2014



In 14 states, immigrant entrepreneurs earned more than **\$1 billion** in income.

We also chart the top 25 states where immigrants earned the most business income in 2014. Business income is an indication of the inherent profitability of a business. In many cases, it also reflects a pool of funds that federal, state, and local governments can tax, supporting services like school and police forces, as well as federal entitlement programs. In 2014, self-employed immigrants in California earned \$20.2 billion in business income, by far the highest total of any state. In 14 states, immigrant entrepreneurs earned more than \$1 billion in income in 2014. That group included places as varied as Connecticut, Georgia, and Washington State.

PART II

The Role of Immigrants and Their Children in the 2016 Fortune 500

Immigrant entrepreneurs have long been an important part of America's economic success story. Kohl's, the Wisconsin-based retail giant, was founded originally by Maxwell Kohl, a Polish immigrant. When Kohl opened his first store, a grocery store in Brookfield, Wisconsin, his English was so poor that customers often had to make their own change and teach him the names of basic products like Corn Flakes.⁹ Today, his company brings in \$19.2 billion in revenue each year. Similarly, Bank of America was founded by Italian immigrant Amadeo Giannini, who wanted to build a bank that catered to "the little fellows"—immigrants who struggled to get loans elsewhere.¹⁰ And Procter & Gamble, one of the world's leading consumer products firms, was started by foreign-born brothers in law, who were seeking a way to more efficiently support their families.¹¹

Stories like these are not uncommon ones. While the data presented in this report so far focuses on today's self-employed immigrants, foreign-born entrepreneurs past and present are behind many of our country's most iconic firms. These companies make enormous contributions to both the U.S. and global economy. They also live on far beyond the founders, generating jobs and economic opportunity far after their original visionaries retire or moved on.

To get a sense of the role immigrants have played founding some of America's largest firms, NAE has in the past analyzed the companies in the Fortune 500, the group of American firms pinpointed by Fortune each

year for boasting the highest revenues in the country. In a widely-cited report released in 2011, NAE found that more than two out of every five Fortune 500 firms had at least one founder who was an immigrant or a child of immigrants. This included 90 companies that were founded directly by immigrants, a group that made up 18 percent of Fortune 500 companies that year.¹²



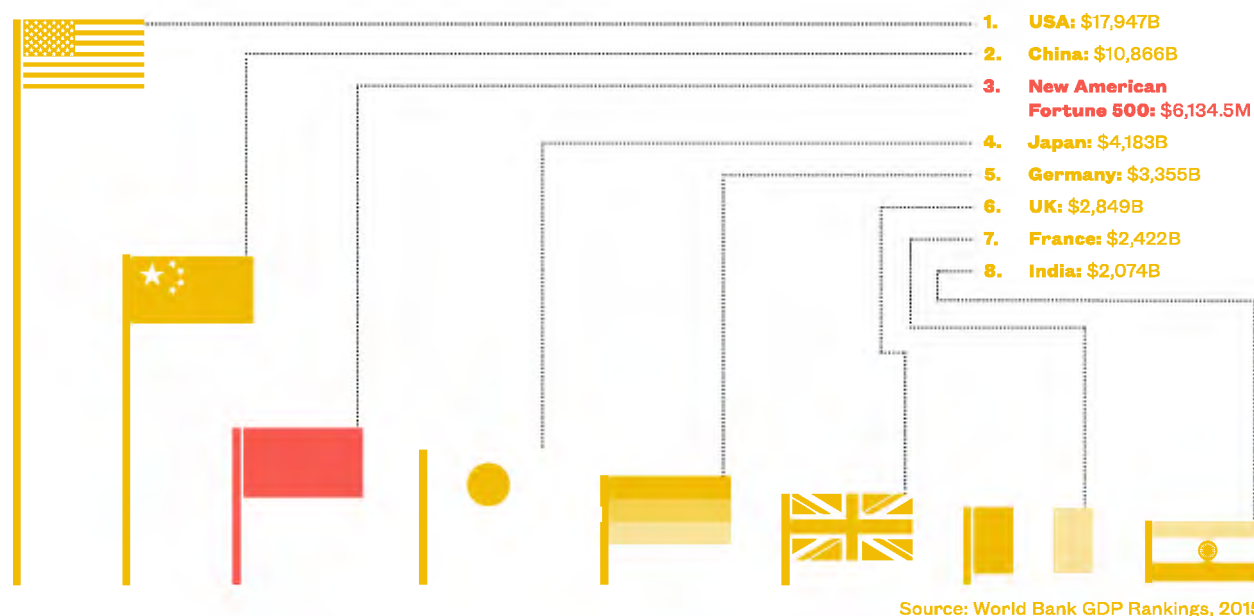
Fortune 500 companies founded by immigrants or their children generate **\$4.8 trillion** in annual revenue and employ **18,910,992** people globally.

In this report, we update our analysis, looking at the companies that made the Fortune 500 list in 2016. The 2016 list is notably changed from four years ago, and

today includes several large technology companies—such as Salesforce.com and Facebook—that were not on the earlier version. The massive role that first and second generation immigrants have played founding America’s most iconic firms, however, remains essentially unchanged. In 2016, 40.2 percent of firms in the Fortune 500, or 201 companies in total, had at least one founder who was either an immigrant or the child of immigrants. A full 89 were founded or co-founded directly by individuals born abroad.

These new American firms make a large impact on both the U.S. economy. The 201 companies with immigrant or children of immigrant founders employed more than 18.9 million people globally in fiscal year 2015. They also brought in \$4.8 trillion in revenue. To put that figure in context, \$4.8 trillion is greater than the GDP of many developed countries in 2015—including Japan, Germany, and the United Kingdom. In fact, if a country had a GDP equal to the revenues of the New American Fortune 500 firms, it would have had the third largest GDP in the world in 2015, behind only the United States and China.

If a country had a GDP equal to the revenues of the New American Fortune 500 firms, it would have the **third largest GDP in the world.**



New American Fortune 500 firms were also made a particularly large impact on the employment picture in several U.S. states. The 14 Fortune 500 firms in Texas with first or second-generation immigrant founders provided jobs to more than 7.2 million people in fiscal year 2015. And Illinois is home to 20 new American Fortune 500 firms, a group that includes iconic companies such as McDonald's, Boeing, and Walgreens. In fiscal year 2015, Illinois' new American Fortune 500 generated \$518.1 billion in revenues and provided jobs to almost 1.5 million workers globally. We show the figures for all states in Figure 3.

FIGURE 3: THE IMPACT OF NEW AMERICAN FORTUNE 500 FIRMS, BY STATE, 2016

	No. of New American Fortune 500 Firms	Revenue (in millions\$)	No. of Employees
AL	1	\$5,674	7,081
AZ	2	\$43,802	53,300
CA	24	\$631,518	1,034,238
CO	3	\$21,588	49,700
CT	8	\$272,566	868,297
DE	1	\$27,940	52,000
FL	8	\$92,538	279,052
GA	5	\$187,723	826,643
IA	1	\$7,052	22,408
IL	20	\$518,064	1,498,187
IN	2	\$10,574	11,671
KS	2	\$11,159	11,272
LA	1	\$11,513	13,579
MA	7	\$134,712	487,253
MD	1	\$46,132	126,000
MI	6	\$194,658	409,300
MN	6	\$92,192	200,742
MO	3	\$36,369	174,238
NC	5	\$126,883	386,380
NE	2	\$24,841	54,900
NJ	8	\$134,978	641,550
NV	2	\$20,879	104,450
NY	30	\$791,548	1,919,169
OH	7	\$222,793	664,218
OK	1	\$7,763	2,364
OR	1	\$7,864	9,574
PA	8	\$288,700	551,850
SC	1	\$5,264	9,850
TN	2	\$28,592	73,500
TX	14	\$375,045	7,209,636
VA	8	\$126,547	500,850
WA	6	\$270,456	515,297
WI	5	\$58,913	142,443

PART III

The Employment Impact of Private Firms

In recent years, particularly in the wake of the Great Recession, creating jobs has been a top priority for many U.S. policymakers. President Barack Obama used a primetime televised address in 2011 to announce a series of job creation proposals he dubbed the American Jobs Act.¹³ Democratic presidential candidate Hillary Clinton has outlined specific job creation plans aimed at everyone from millennials to manufacturing workers.¹⁴ And Republican hopeful Donald Trump declared in the speech announcing his candidacy that he would be “the greatest jobs president that God has ever created.”¹⁵

While rarely the focus of such political initiatives, research consistently shows that immigrants—and the business they own—are major generators of valuable U.S. jobs. In 2010, roughly one in 10 American workers employed at private firms were working at immigrant-founded companies.¹⁶ In this report, we analyze the Survey of Business Owners, product of the U.S. Census, to determine the number of people employed at firms owned by immigrants. This data is from 2007, the most recent year for which figures available. For privacy reasons, the survey excludes large, publicly traded firms, making the figures inherently conservative in nature.

In 2010, roughly **one in 10** American workers employed at private firms were working at immigrant-founded companies.

We find that in 2007, more than 5.9 million workers held jobs at private immigrant owned firms. In several states, the number of people employed at such companies

was particularly significant. In California, for instance, almost 1.5 million people held jobs at immigrant-owned companies. The equivalent figure was roughly 500,000 people in Florida. Overall, in 16 U.S. states, more than 100,000 residents were employed at firms owned by immigrants. This group included states such as Virginia, Arizona, and Texas.

FIGURE 4: EMPLOYMENT IMPACT OF IMMIGRANT-OWNED FIRMS, 2007

5,934,147

Number of employees
at immigrant-owned firms.

A large grid of red asterisks forming a rectangular shape, with a small red heart symbol at the top center. The grid is composed of 20 rows and 30 columns of asterisks. The heart symbol is located at the top center of the grid, above the first row of asterisks.

*** = 10,000 people**

FIGURE 5: SHARE OF NEW BUSINESSES FOUNDED BY IMMIGRANTS IN SELECT STATES, 2007-2011

California: 44.6%

New York: 42.0%

Florida: 36.7%

New Jersey: 35.2%

Illinois: 32.1%

With their high levels of entrepreneurship, immigrants played an important role founding new businesses and helping communities recover in the wake of the Great Recession. From 2007 to 2011, **immigrants founded more than three out of every 10 new businesses** in five key states.

In 2011, a period when the country was still struggling to create jobs, immigrants were **more than twice as likely** to found a new business than the native-born.

In the years immediately after the Great Recession, a time when many companies were contracting their operations, there is also evidence that immigrants continued founding companies and creating American jobs. A 2012 NAE study written by Robert Fairlie, a professor at the University of California, Santa Cruz, found that in 2011, a period when the country was still struggling to create jobs, immigrants were more than twice as likely to found a new business than the native-born. That year, foreign-born residents founded businesses at the rate of 550 new businesses per month for every 100,000 immigrants. The equivalent native-born rate was only 270 new businesses per month.¹⁷

NAE was also able to isolate the share of new businesses started by immigrants in several states from 2007 to 2011, the critical period at the beginning of the country's economic recovery. During that time, immigrants founded 44.6 percent of all new businesses in California. They founded 42.0 percent of all new businesses in New York as well.¹⁸

Claudia Mirza, the CEO and Co-Founder of Akorbi, a translation and multilingual staffing firm, is one of many immigrants in the country whose work is creating valuable jobs and opportunities for others. Mirza had a long wait before she could come to America. As a child, her father moved to the country to work as a farm laborer, leaving Mirza and her mother behind in their native Colombia. Mirza, who was raised largely in poverty, attended a prestigious Colombian school on an academic scholarship. She was finally able to join her father in the United States after graduating from college, arriving initially on a tourist visa.

Now years later, Mirza is a U.S. citizen. And Akorbi, a firm she founded with another immigrant—her husband, an Indian native—is rapidly taking off. The Plano, Texas based firm provides its services to large companies like Google, Aetna, and Blue Cross Blue Shield. Akorbi is on track to produce \$40 million in revenues this year. It also provides both full and part-time jobs to 670 Americans.

PART IV

Punching Above Their Weight Class as Entrepreneurs

The oversized role that immigrants play as entrepreneurs means that the foreign-born population frequently makes up a larger share of entrepreneurs in the country than they do the U.S. population as a whole. While immigrants made up 13.2 percent of the U.S. population in 2014, they represented 20.6 percent of all entrepreneurs in the country that year—or more than one out of every five business owners in America.

While the phenomenon of immigrants punching above their weight class as entrepreneurs exists in the large majority of states, it is particularly pronounced in some parts of the country. In Florida, for instance, one in three entrepreneurs in the state are immigrants, despite the fact that foreign-born Americans make up only about one in five residents in the state overall. Similarly, in Nevada, 19.3 percent of entrepreneurs are foreign-born, although immigrants account for just 10.6 percent of the state’s population. We show the figures for the top 15 states where immigrants are most dramatically overrepresented as business owners here.

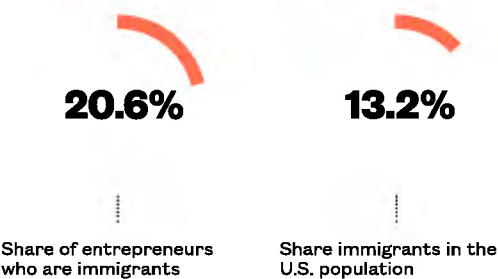


FIGURE 6: TOP 15 STATES WHERE IMMIGRANTS PUNCHED ABOVE THEIR WEIGHT AS ENTREPRENEURS IN 2014

State	Immigrant Share of Self-Employed Population	Immigrant Share of Total Population	Difference
FL	33.2%	20.0%	13.2%
TX	28.9%	16.7%	12.2%
CA	38.4%	27.0%	11.4%
MD	25.9%	14.8%	11.1%
NV	29.9%	19.3%	10.6%
NJ	32.3%	21.7%	10.6%
NY	32.7%	22.6%	10.1%
IL	22.1%	13.7%	8.4%
AZ	22.0%	13.7%	8.3%
VA	20.2%	12.1%	8.1%
GA	17.7%	9.8%	7.9%
CT	21.3%	13.7%	7.6%
DC	19.7%	14.1%	5.6%
LA	9.1%	4.0%	5.1%
MA	20.7%	15.6%	5.1%

PART V

Entrepreneurship Within Immigrant Subgroups

In recent years, there has been some concern that new business creation in the United States as a whole has been slowing. The Kauffman Foundation, a nonprofit that studies entrepreneurship, reported that startup activity in the United States declined between 2010 to 2015.¹⁹ During that period, however, immigrants continued to start new businesses at a rapid rate—making them the rare bright spot during a troubling period for business generation overall.²⁰

Between 2010 and 2015, a period when the country's overall startup activity was slowing, immigrants continued to found new business at a rapid rate.

In our analysis of 2014 data, we find that immigrants indeed boasted higher entrepreneurship rates that year than the broader U.S. population. In 2014, 11.6 percent of all immigrants in the workforce were entrepreneurs. This figure was considerably higher than the rate for the U.S. working population as a whole, which sat at 9.5 percent that year. The rate for natives was even lower: 9.1 percent of U.S.-born Americans in the workplace were self-employed in 2014.

Those figures tell a powerful story about how immigrants—taken as a whole—continue to start new businesses and generate jobs for Americans. Drilling down to specific ethnic and national origin groups within the immigrant population, we can see that many groups within the foreign-born population exhibit higher than average entrepreneurship rates as well. In 2014, 10.6

percent of immigrants who identified as Asian were self-employed entrepreneurs. Similarly, a full 11.1 percent of Hispanic immigrants were entrepreneurs in 2014. This finding on the Hispanic population shows the sea change that has happened in recent years regarding entrepreneurship among this group. While as recently as 2000, Hispanic immigrants were less likely than the broader U.S. population to have their own businesses, this pattern has shifted notably in recent years.²¹ One 2014 NAE study in fact found that between 1996 and 2012, the number of Hispanic immigrant entrepreneurs in the country more than quadrupled. The number of Mexican immigrant entrepreneurs grew by a factor of 5.4.²²

While those figures are impressive, our analysis revealed one group that exhibited particularly high entrepreneurship rates: The almost 1.5 million immigrants in the country that hail from the Middle East and North Africa, also known as MENA countries, a group that has come under particular criticism during the most recent election cycle.

One group that exhibited particularly high entrepreneurship rates: The almost 1.5 million immigrants in the country that hail from the Middle East and North Africa.

In 2014, 19.1 percent of all MENA immigrants were entrepreneurs—more than double the rate for the country as a whole. The outsize role the MENA population plays founding businesses holds even when

Israeli nationals, a group known for producing large numbers of technology startups, are excluded from our count.²³ In 2014, more than one in four Israeli immigrants in the country, or 26.2 percent, were self-employed. For MENA immigrants with Israelis excluded, the entrepreneurship rate was 17.9 percent, still far above the rate for the U.S. population as a whole.

The supercharged entrepreneurial activity of MENA immigrants has been critically important to several American cities that draw large numbers of such immigrants. The challenges faced by the city of Detroit in recent decades have been well chronicled. Between the city's heyday in 1950 and the early 2000s, the city's population shrunk by roughly 60 percent. The city had also shed about a fifth of its jobs. By the time Detroit filed for bankruptcy in 2013, it had an unemployment rate nearly double the national average.²⁴ Detroit, however, has also long attracted MENA immigrants. Roughly a third of the residents of Dearborn, a Detroit suburb, are of Middle Eastern descent.²⁵ Immigrants from MENA countries also make up roughly one out of every 10 residents of the Detroit metropolitan area overall.²⁶

In recent years, as Detroit has taken steps to rebuild and revitalize its economy, MENA immigrants have played an important role founding and maintaining local firms.

Some 15,000 businesses in the Detroit metropolitan area are owned by Middle Eastern immigrants and their families, according to Fay Beydoun, Executive Director of the American Arab Chamber of Commerce. Those firms generate between \$5.4 and \$7.7 billion in wages and salary earnings each year.²⁷ They also make an annual economic impact of \$36.4 billion.²⁸

Middle Eastern business owners are frequently credited as an important part of Detroit's recent economic comeback.

These immigrant-owned businesses take on a variety of forms. Business owners include high-power investors like Israeli-born billionaire Tom Gores, who saved hundreds of jobs in 2009, when he bought the bankrupt boat manufacturer Four Winns. On the other end of the spectrum, Beydoun says that 90 percent of Detroit's gas stations are owned by Arab Americans, while a majority of convenience stores are owned by Chaldeans, an Iraqi Catholic group. "When Detroit was going through the recession, these two groups did not abandon the city," Beydoun says, "Their businesses stayed open and provided services, especially to low income households." Given that, they are frequently credited as an important part of Detroit's recent economic comeback.²⁹

Entrepreneurship rates for immigrant subgroups in 2014:

Middle East and North African Immigrants

19.1%

Hispanic Immigrants

11.1%

Asian Immigrants

10.6%

U.S. Workers Overall

9.5%

PART VI

The Challenges Our Immigration System Poses to Entrepreneurs

Despite the important role that immigrants are currently playing founding new businesses and providing jobs to American workers, our current immigration system has not made it easy for foreign-born entrepreneurs to settle and grow their companies on U.S. soil. Currently, there is no visa to come to the country, start a company, and create jobs for U.S. workers—even if an entrepreneur already has a business plan and has raised hundreds of thousands of dollars to support his or her idea. A six-year effort to create a formal start-up visa also died in Congress last year.³⁰ Trying to exploit that flaw in our system, countries around the world—from Canada to Singapore, Australia to Chile—have enacted startup visas, often with the explicit purpose of luring away entrepreneurs who want to build a U.S. business but cannot get a visa to do so.³¹

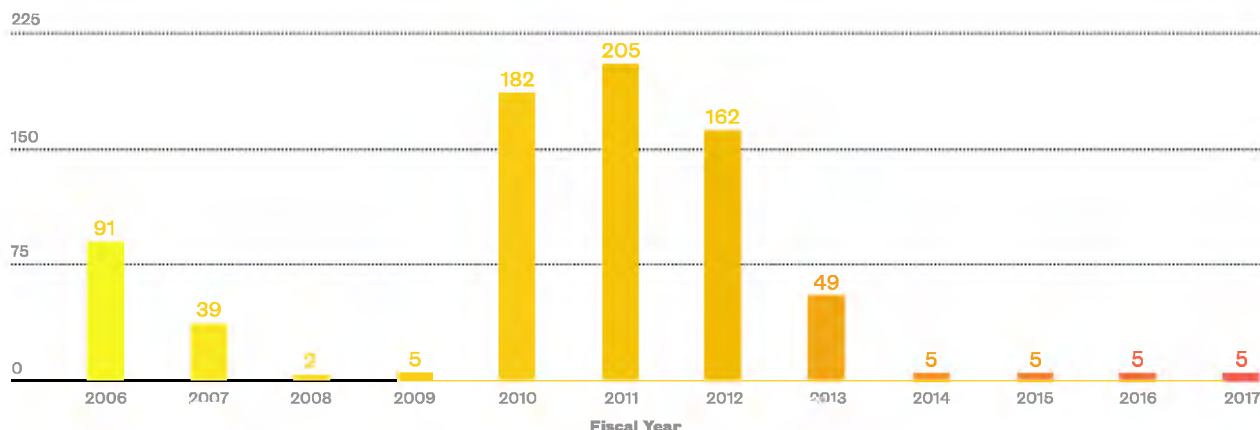
Entrepreneurs who chose to remain in the United States often face major challenges trying to navigate our current visa system. To access a visa, many business owners sell a majority stake in their company and then apply for a visa as a high-skilled worker rather than the owner of their firm. After making that sacrifice, however, many find they still face an uphill road to obtain a visa. The H-1B visa, the most common visa used by high-skilled workers, is capped at 85,000 visas per year for private companies. In recent years that visa cap has been reached in remarkable speed.³² In 2015, the USCIS received 233,000 visa applications from U.S. companies in the first seven days of the application window—nearly double the number they received just

two years prior. When the cap is exhausted in the first week, the government stops accepting applications, and selects who ultimately receives the visa through a random lottery, effectively leaving the fate of many entrepreneurs up to a process beyond their control.

When the H-1B cap is exhausted in the first week, the government decides who ultimately receives the visa through a random lottery, leaving the fate of many entrepreneurs up to a process beyond their control.

Obtaining a visa for workers of “extraordinary ability,” another category fused by some entrepreneurs, also can be challenging. To apply for an O-1 visa, which allows individuals in that category to remain in the country temporarily, or the EB-1 visa, a similar green card category, entrepreneurs often must amass what amounts to hundreds of pages of documents to prove their case, a lengthy and expensive process. Of the eight criteria the government uses to determine if a person is extraordinary, few are well-suited to the nature of entrepreneurship. Business owners with new or young businesses may not yet have achieved “national or international recognition” for their work or high compensation compared to their peers, two measures used to assess applications.³³ Entrepreneurs who come

Number of days until H-1B cap reached:



from outside academia are also unlikely to have articles published in academic journals, another achievement that factors into the visa decision.³⁴

Of the eight criteria the government uses to determine if someone is eligible for an extraordinary ability visa, few are well-suited to the nature of entrepreneurship.

In this environment, some immigrant entrepreneurs have had to leave the country after being able to secure the visa they need to run their business—taking valuable American jobs with them. Love Sarin, the former co-founder of Banyan Environmental, is one promising business owner who left the country because of our current immigration system. While studying to get a PhD in chemical engineering at Brown University in Rhode Island, Sarin, an Indian native, discovered that the element Selenium had properties that could help neutralize harmful mercury in the body. By 2009, he and an advisor had co-founded Banyan Environmental, a firm designed to commercialize their work. Sarin and his team envisioned a future where the technology could

be used to make coal-fired power plants less harmful to consumers, potentially saving millions in healthcare costs each year.

Despite earning two competitive grants from the National Science Foundation, however, Sarin found his path to remain in the United States was not an easy one. He applied for a green card for people with extraordinary abilities. Despite his accolades and patents, it was rejected in 2009. “We were really excited about the work [Banyan was doing] and our potential for growth,” Sarin says. Given that, he says the visa rejection was “shocking and frustrating.” It also cost the U.S. economy jobs. At one point, Banyan had employed three full time people, and also provided work to local contractors, like accountants and legal advisors.

Several venture capitalists and entrepreneurs, frustrated by stories like Sarin’s, have been tried in recent years to find ways around our broken immigration system. Jeff Busgang in Boston and Brad Feld in Colorado, two venture capital leaders, have launched programs that bring over foreign-born entrepreneurs to serve as “entrepreneurs in residence” at colleges and universities. Because nonprofit academic institutions are exempt from the H-1B cap, such entrepreneurs can secure their visas by working as mentors at a school, and then

build their startups in their free time. These innovative programs, which are currently available at 13 colleges and universities across the country, are already resulting in meaningful economic contributions. As of mid-2016, 23 entrepreneurs had secured visas through these programs nationally. The companies they founded had created 261 jobs and raised almost \$120 million in funding.³⁵

In August, the Department of Homeland Security proposed an administrative rule that would allow entrepreneurs to remain in the country for up to five years if they have at least **\$100,000** in government funding, **\$345,000** in venture capital backing.

Still, given the limited the number of spots currently available, entrepreneurship in residence programs hardly represent a long-term solution. Advocates have asked Congress for years to create a formal startup visa for entrepreneurs, but made little progress given the current gridlock in Washington. Facing this situation, the White House recently took steps to make it easier for aspiring entrepreneurs to stay in the United States. In August, the Department of Homeland Security proposed an administrative rule that would allow entrepreneurs to remain in the country for up to five years if they have at least \$100,000 in government funding, \$345,000 in venture capital backing, or other evidence that their firms are poised for rapid revenue or job growth. The rule allows entrepreneurs to remain in the United States on “parole status,” a designation that gives someone temporary permission to remain in the country if their presence represents a “significant public benefit.” While representing an exciting moment for entrepreneurs, an administrative rule of this sort is in many ways inherently precarious. Future administrations could choose to enforce the rule differently or abandon the program for new entrepreneurs altogether.

Meanwhile, in Silicon Valley, our country’s most prominent center for startup activity, there is already evidence that our broken visa system is taking a toll on immigrant startup activity. One study by researchers at Duke University and University of California-Berkeley found that from 2006 to 2012, 43.9 percent of high-tech companies in Silicon Valley were founded by immigrants.³⁶ That figure, while compelling, represented a decline compared to earlier years, particularly the period that included the late 1990s and early 2000s. During those years, the government allocated more H-1B visas than it does now, at one point providing 195,000 visas to the private sector each year.³⁷ Such policies may have made a difference: From 1995 to 2005, more than half of high-tech startups in Silicon Valley, or 52.4 percent, had foreign-born founders, a higher share than in the seven years that followed.³⁸

In Silicon Valley, our country’s most prominent center for startup activity, there is already evidence that our broken visa system is **taking a toll on immigrant startup activity.**

Conclusion

This report demonstrates the real and meaningful impact that immigrants are currently playing starting new businesses and powering U.S. economic growth. In 2014, more than 20 percent of entrepreneurs in the country were immigrants. Almost six million Americans were also working at immigrant-owned firms in 2007. Foreign-born Americans also played a large role starting some of our country's most iconic firms. More than 40 percent of companies in the Fortune 500 have at least one founder who either immigrated to the United States or was the child of immigrants. Several of our most successful technology companies, such as YouTube, Tesla Motors, and Google, were also founded by new Americans too, as were countless grocery stores, restaurants, nail salons, and other small businesses in cities big and small across the country.

Despite their outsize contributions, however, our country in recent years has not done enough to welcome and encourage foreign-born entrepreneurs. The H-1B visa program for high skilled immigrants is outdated and hard for many entrepreneurs to access. The O-1 visa program is unpredictable and expensive as well. In this context, the White House's recent move to allow entrepreneurs to remain in the country on temporary parole status represents an important and much needed step in the right direction. But it doesn't go far enough. Immigrant entrepreneurs employ almost six million workers in America. Given their enormous contributions, they deserve a more permanent legislative fix next year.

Endnotes

- 1** Jason Wiens and Chris Jackson, "The Importance of Young Firms for Economic Growth," September 13, 2015, <http://www.kauffman.org/what-we-do/resources/entrepreneurship-policy-digest/the-importance-of-young-firms-for-economic-growth>.
- 2** John Haltiwanger, Ron S. Jarmin, and Javier Miranda, "Who Creates Jobs? Small Versus Large Versus Young," *The Review of Economics and Statistics* 95, no. 2 (May 2013): 347–61.
- 3** For purposes of this report, we define working-age as those ages 25 to 64.
- 4** Vivek Wadhwa et al., "America's New Immigrant Entrepreneurs: Part I," SSRN Scholarly Paper, Social Science Research Network, 2007, <http://papers.ssrn.com/abstract=990152>; Robert Fairlie, "Open For Business: How Immigrants Are Driving Small Business Creation In The United States," Partnership for a New American Economy, 2012, <http://www.renewoureconomy.org/research/open-for-business-how-immigrants-are-driving-small-business-creation-in-the-united-states-2/>.
- 5** Arnobio Morelix et al., "The Kauffman Index 2015: Startup Activity, State Trends," SSRN Scholarly Paper, Social Science Research Network, 2015, <http://papers.ssrn.com/abstract=2614598>.
- 6** David Dyssegaard Kallick, "Bringing Vitality to Main Street: How Immigrant Small Businesses Help Local Economies Grow," New York: Fiscal Policy Institute and Americas Society/Council of the Americas, 2015, <http://www.as-coa.org/articles/bringing-vitality-main-street-how-immigrant-small-businesses-help-local-economies-grow>.
- 7** Stuart Anderson, "Immigrants and Billion Dollar Startups," NFAP Policy Brief March, 2016, <http://nfap.com/wp-content/uploads/2016/03/Immigrants-and-Billion-Dollar-Startups.NFAP-Policy-Brief.March-2016.pdf>.
- 8** Ben Casselman, "St. Louis Is The New Startup Frontier," *FiveThirtyEight*, September 12, 2016, <http://fivethirtyeight.com/features/st-louis-is-the-new-start-up-frontier/>.
- 9** Badger, Emily. "Public Servant." *Milwaukee Magazine*, August 23, 2010.
- 10** "Who Made America? A.P. Giannini," PBS.org, accessed September 1, 2016, http://www.pbs.org/wgbh/they-madeamerica/whomade/giannini_hi.html.
- 11** "Our History-- How It Began," Procter & Gamble Corporate Website, accessed September 1, 2016, https://www.pg.com/en_US/downloads/media/Fact_Sheets_CompanyHistory.pdf.
- 12** The Partnership for a New American Economy, "The 'New American' Fortune 500," June 2011, <http://www.renewoureconomy.org/wp-content/uploads/2013/07/new-american-fortune-500-june-2011.pdf>.
- 13** "The American Jobs Act -- One Year Later," MSN-BC, September 7, 2012, <http://www.msnbc.com/rachel-maddow-show/the-american-jobs-act-one-year-later>.
- 14** "Hillary Clinton's Jobs Plan for Millennials," Hillary Clinton Presidential Campaign Website, accessed September 1, 2016, <https://www.hillaryclinton.com/briefing/factsheets/2016/08/08/hillary-clintons-jobs-plan-for-millennials/>; "Hillary on Manufacturing," Hillary Clinton Presidential Campaign Website, accessed September 1, 2016, <https://www.hillaryclinton.com/issues/manufacturing/>.

- 15 Reuters, "I Will Be the Greatest Jobs President That God Has Ever Created": Trump," New York Post, June 16, 2015, <http://nypost.com/2015/06/16/i-will-be-the-greatest-jobs-president-that-god-ever-created-trump/>.
- 16 Fairlie, 2012.
- 17 Fairlie, *ibid*.
- 18 *Ibid*.
- 19 Fairlie et al., "The Kauffman Index of Startup Activity 2015" (Ewing Marion Kauffman Foundation, 2015), http://www.kauffman.org/-/media/kauffman_org/research%20reports%20and%20covers/2015/05/kauffman_index_startup_activity_national_trends_2015.pdf.
- 20 *Ibid*.
- 21 Alberto Davila, Marie T. Mora, and Angela Marek Zeitlin, "Better Business: How Hispanic Entrepreneurs Are Beating Expectations and Bolstering the U.S. Economy" (Partnership for a New American Economy, 2014), <http://www.renewoureconomy.org/wp-content/uploads/2014/04/hispanic-entrepreneurs-final.pdf>.
- 22 *Ibid*.
- 23 Rip Empson, "Startup Genome Ranks The World's Top Startup Ecosystems: Silicon Valley, Tel Aviv & L.A. Lead The Way," TechCrunch, November 20, 2012, <http://social.techcrunch.com/2012/11/20/startup-genome-ranks-the-worlds-top-startup-ecosystems-silicon-valley-tel-aviv-l-a-lead-the-way/>.
- 24 Monica Davey and Mary Williams Walsh, "Billions in Debt, Detroit Tumbles Into Insolvency," The New York Times, July 18, 2013, <http://www.nytimes.com/2013/07/19/us/detroit-files-for-bankruptcy.html>.
- 25 Ola Marie Smith, Roger Y.W. Tang, and Paul San Miguel, "Arab-American Entrepreneurship in Detroit, Michigan," American Journal of Business 27, no. 1 (2012): 58-78.
- 26 Norm Sinclair, "From the Middle East to the Motor City," DBusiness Magazine, May 25, 2016, <http://www.dbusiness.com/March-April-2016/From-the-Middle-East-to-the-Motor-City/#.V82WamXScyl>.
- 27 Smith, Tang, and Miguel, "Arab-American Entrepreneurship in Detroit, Michigan."
- 28 Sinclair, "From the Middle East to the Motor City."
- 29 Green, Jeff, "Detroit's Comeback Has an Arabic Accent," Bloomberg.com, accessed September 1, 2016, <http://www.bloomberg.com/news/articles/2016-02-18/detroit-s-comeback-has-an-arabic-accent>.
- 30 Ellen Huet, "How Tech Startup Founders Are Hacking Immigration," Bloomberg.com, accessed September 6, 2016, <http://www.bloomberg.com/news/articles/2016-02-10/how-tech-startup-founders-are-hacking-immigration>.
- 31 *Ibid*.
- 32 It is important to note that ongoing flaws in the H-1B program, which NAE has long advocated changing, contribute to this phenomenon. The safeguards in the H-1B program designed to protect American workers have not been updated since 1998. In the absence of legislation, a small number of outsourcing firms have been able to use the H-1B program to bring in employees. The significant number of visas used by such firms makes it even harder for entrepreneurs to secure them.
- 33 "O-1 Visa: Individuals with Extraordinary Ability or Achievement," USCIS, accessed September 6, 2016, <https://www.uscis.gov/working-united-states/temporary-workers/o-1-visa-individuals-extraordinary-ability-or-achievement>.
- 34 *Ibid*.
- 35 Craig Montuori, email message to author, June 23, 2016.

- 36** "O-1 Visa: Individuals with Extraordinary Ability or Achievement," USCIS, accessed September 6, 2016, <https://www.uscis.gov/working-united-states/temporary-workers/o-1-visa-individuals-extraordinary-ability-or-achievement>.

- 37** "Report on H-1B Petitions, Fiscal Year 2005, Annual Report" (United States Citizenship and Immigration Services, April 2006), https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/h1b05annual_08_7.pdf.

- 38** Vivek Wadhwa et al., "America's New Immigrant Entrepreneurs: Part I," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 2007), <http://papers.ssrn.com/abstract=990152>.

ABOUT

New American Economy

The Partnership for a **New American Economy** brings together more than 500 Republican, Democratic and Independent mayors and business leaders who support sensible immigration reforms that will help create jobs for Americans today.

Visit **www.renewoureconomy.org** to learn more.



EXHIBIT 3



OPEN FOR BUSINESS

HOW IMMIGRANTS ARE DRIVING
SMALL BUSINESS CREATION IN THE UNITED STATES

A REPORT BY
THE PARTNERSHIP FOR A NEW AMERICAN ECONOMY

— AUGUST 2012 —



**PARTNERSHIP FOR A
NEW AMERICAN
ECONOMY**

The Partnership for a New American Economy brings together more than 450 Republican, Democratic, and Independent mayors and business leaders who support immigration reforms that will help create jobs for Americans today. The Partnership's members include mayors of more than 35 million people nationwide and business leaders of companies that generate more than \$1.5 trillion and employ more than 4 million people across all sectors of the economy, from Agriculture to Aerospace, Hospitality to High Tech, and Media to Manufacturing. Partnership members understand that immigration is essential to maintaining the productive, diverse, and flexible workforce that America needs to ensure prosperity over the coming generations.

Learn more at: www.renewoureconomy.org

REPORT AUTHORED BY ROBERT W. FAIRLIE

Professor of Economics
University of California, Santa Cruz

OPEN FOR BUSINESS

HOW IMMIGRANTS ARE DRIVING SMALL BUSINESS CREATION IN THE UNITED STATES

Executive Summary2

1 **Introduction**4

2 **Immigrant Entrepreneurs Start Businesses at Growing Rates While Native-Born Entrepreneurship Falters**6

3 **Immigrant-Owned Firms Drive the U.S. Export Economy**10

4 **Immigrant-Owned Businesses Generate Substantial Business Income and Revenue**12

5 **Immigrant-Owned Businesses Create Millions of Jobs and Pay Out Billions of Dollars in Employee Salaries**14

6 **Immigrant-Owned Businesses Power Many Sectors of the American Economy**16

7 **Immigrants Punch Above Their Weight in States Across the Country**20

8 **Immigrant Entrepreneurs in the United States Come from Around the World**22

9 **Immigrants of All Education Levels Are Contributing to Business Creation and Growth**24

Conclusion26

Appendices28

References34

EXECUTIVE SUMMARY

THE AXIOM THAT SMALL BUSINESSES DRIVE JOB GROWTH IS NOT QUITE CORRECT. IT IS YOUNG BUSINESSES THAT DRIVE JOB GROWTH.

Businesses under five years old are responsible for all net job creation over the past three decades in America.¹ Unfortunately, the rate of new-business generation is declining: In 2010, it reached the lowest rate in the 30-year history of recorded data.² So as America attempts to grow its way out of the recession and create more jobs for American workers, new-business generation should be one of, if not the, primary focus of our economic strategy.

This report examines and assesses a critical driver of new business creation in America: entrepreneurial immigrants. Leaving one's home and immigrating to a new country to start a new life is itself an entrepreneurial act, so it is perhaps unsurprising that immigrants are disproportionately entrepreneurial.

Previous research has shown how greatly we depend on immigrant entrepreneurs. The Partnership for a New American Economy found that immigrants or their children founded more than 40 percent of America's Fortune 500 companies, and the Fiscal Policy Institute recently reported that immigrants now own more than 18 percent of all incorporated businesses in the United States.

This report shows that the prevalence of immigrant entrepreneurs and their importance to the U.S. economy are only growing. Over the last 15 years, while native-born Americans have become less likely to start a business, immigrants have steadily picked up the slack. Immigrants are now more than twice as likely as the native-born to start a business and were responsible for more than one in every four (28 percent) U.S. businesses founded in 2011, significantly outpacing their share of the population (12.9 percent).

Relying on the American Community Survey, the Current Population Survey, and the Survey of Business Owners, this report analyzes the expanding role that immigrant entrepreneurs play in our economy. While their businesses tend to be smaller than those started by their native-born counterparts, collectively immigrant businesses are having an enormous impact on the U.S. economy. Immigrant-owned businesses now employ one out of every ten U.S. workers at privately owned-companies and add more than \$775 billion dollars of revenue to the U.S. gross domestic product.

From new laundromats in the neighborhood to new listings on NASDAQ, immigrants are making their mark – playing an ever-increasing role in starting new businesses, creating jobs, increasing exports, and growing the economy. Even more remarkable, immigrant entrepreneurship is increasing at a time when the economy has lagged. As the country looks for ways to generate economic growth and new jobs, any serious discussion must include the growing impact of immigrants as drivers of new-business creation.

KEY FINDINGS

Immigrants are increasingly likely to start a business, while the rate of new-business generation among the native-born is declining:

The rate at which immigrants start new businesses grew by more than 50 percent between 1996 and 2011. During the same period, the business-formation rate for the native-born declined by 10 percent.

Immigrants are more than twice as likely to start a business as the native-born.

In 2011, the immigrant business-formation rate was 550 new businesses per month for every 100,000 immigrants, while the native-born rate was only 270 new businesses per month for every 100,000 native-born.

Immigrants started 28 percent of all new U.S. businesses in 2011, despite accounting for just 12.9 percent of the U.S. population. Just a decade and a half earlier, in 1996, only 15 percent of new U.S. businesses were founded by immigrants.

Immigrant businesses are smaller than those started by the native-born, but their collective impact on the U.S. economy is huge and growing. Over the last decade the income generated by native-owned businesses increased just 14 percent and failed to keep pace with inflation. Income from immigrant-owned businesses, meanwhile, increased by more than 60 percent. Immigrant-owned firms now generate more than \$775 billion in revenue, \$125 billion in payroll, and \$100 billion in income, employing one out of every 10 workers along the way.

Immigrants start more than 25 percent of all businesses in seven of eight sectors of the economy that the U.S. government expects to grow the fastest over the next decade.

From 2007 to 2011, immigrants founded an outsized share of new businesses in health care and social assistance (28.7 percent), professional and business services (25.4 percent), construction (31.8 percent), retail trade (29.1 percent), leisure and hospitality (23.9 percent), educational services (28.7 percent), "other services" (28.2 percent), and transportation and utilities (29.4 percent).



INTRODUCTION

Alex Torrenegra saw a computer for the first time at his grandfather's office in Bogota, Colombia when he was 4 years old, and he knew immediately that he needed to have one. Computers were not prevalent in Colombia at the time, so it took Alex until he was 14 years old to obtain one. But it didn't take him long to figure out how to use it. The same year he got a computer he founded his first computer business to offer IT solutions to small and mid-sized Colombian companies. By the time he was 19 he already had 20 employees working for him.

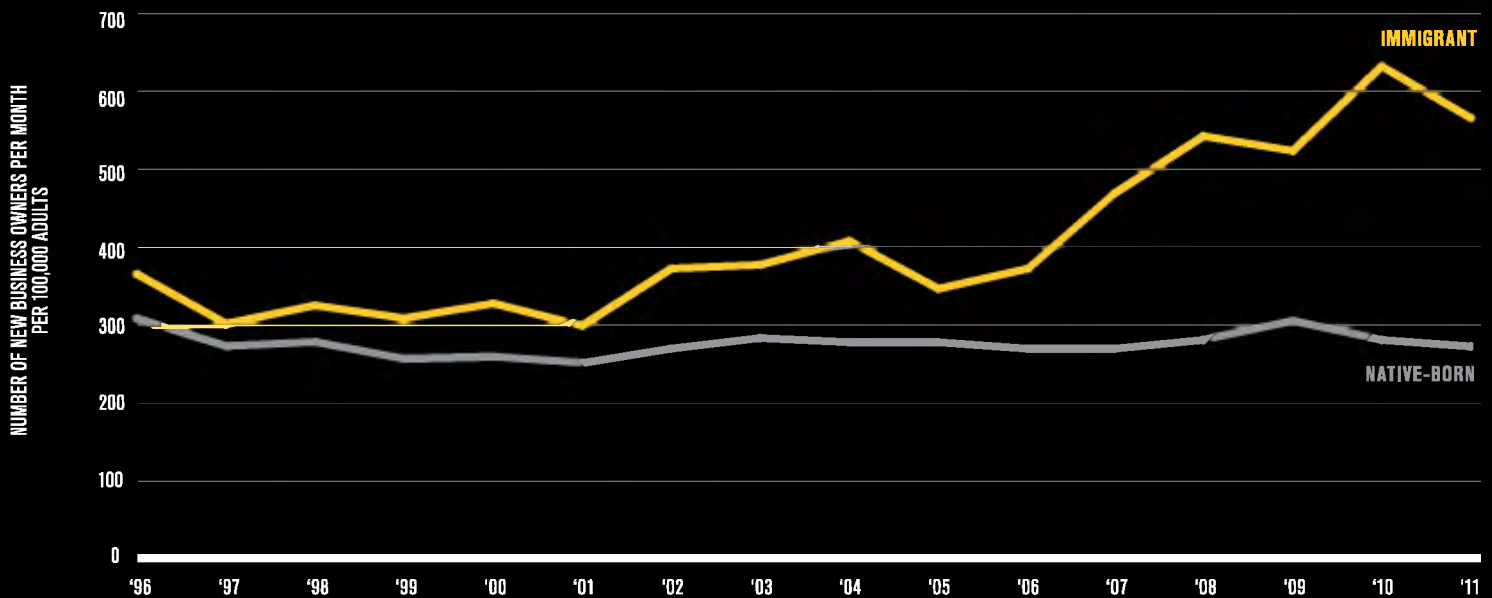
Alex left Colombia with his family in 1998 for security reasons and came to the United States, where he found not only safety, but also a ripe environment to put his entrepreneurial savvy to work. The first computer company he founded in the United States hired six employees in its first year. That success inspired Alex to become a serial entrepreneur founding roughly a dozen companies that together transact about \$35 million each year.

Alex's latest venture, VoiceBunny.com, uses patented technology to connect voiceover artists with companies that need them. VoiceBunny already employs 11 people in the United States, has a pool of over 100,000 voiceover artists using the site, and has clients that include the movie giant Pixar. The company even engages in what is effectively reverse-outsourcing, since many of its clients are overseas companies that hire American voiceover artists to promote their products.³

Alex's story is repeated throughout the economy every day. From Vietnamese immigrant Nancy Nguyen's burgeoning Sweet T Salon in Raleigh, North Carolina to the empire that Belgian immigrant Liz Claiborne launched with her eponymous fashion line, more than four thousand immigrants start new businesses in America every day.⁴ Their path to come here is often fraught with legal, economic, and social obstacles, but the entrepreneurial opportunities that await them in America are enough to draw many of the most creative, risk-taking individuals in the world. As the findings of this report demonstrate, millions of Americans have their jobs today because of businesses founded by immigrants, and more than \$100 billion dollars in income is generated each year by immigrant-owned businesses.

THE START-UP RATE OF IMMIGRANTS HAS GROWN BY 50% WHEREAS THE RATE OF U.S.-NATIVES DECLINED 10%

CURRENT POPULATION SURVEY (1996-2011)



Past research has shown that immigrants play an enormous role in founding American businesses, including a recent study by the Fiscal Policy Institute that found that immigrants own 18 percent of incorporated businesses.⁵ As this report explains, U.S. dependence on immigrant entrepreneurs is only increasing, while native-born entrepreneurialism has faltered. As the U.S. attempts to grow its way out of the recession, new-business creation by native-born Americans has hit a 30-year low. But immigrant entrepreneurs are filling the gap and starting more businesses, creating more jobs, and bringing more revenue to the economy, facts that should be critical to policymakers looking for viable ways to promote economic recovery.

To quantify the rise of immigrant entrepreneurship, this report relies on three nationally representative datasets – the 2006-2010 American Community Survey (ACS), the 2007-2011 Current Population Survey (CPS), and the 2007 Survey of Business Owners (SBO). These datasets allow for analysis of the role that immigrants and the native-born have in starting businesses, generating business revenue and income, employing workers, and growing our export economy.⁶ And to better understand who the new immigrant entrepreneurs are and in what regions and industries they are having the most impact, the report also examines where immigrant business owners come from, what sectors of the economy they contribute to most, and which states are the most impacted by their contributions.

The findings demonstrate that immigrant entrepreneurs like Alex Torrenegra are playing a large and increasing role in creating American jobs, exporting goods, and driving the U.S. economy.



IMMIGRANT ENTREPRENEURS START BUSINESSES AT GROWING RATES WHILE NATIVE-BORN ENTREPRENEURSHIP FALTERS

Young businesses are essential to job creation. After reviewing 30 years of Census Bureau business data, the Kauffman Foundation found that startups create an average of 3 million new jobs in their first year, and that without them, “there would be no net job growth in the U.S. economy.”⁷ Reforms to encourage startup activity are central to the job growth strategies of both Republican and Democratic leaders. A recent example is the Jumpstart Our Business Startups (JOBS) Act, a bill to make it easier to finance new startups that was introduced by House Republicans and signed into

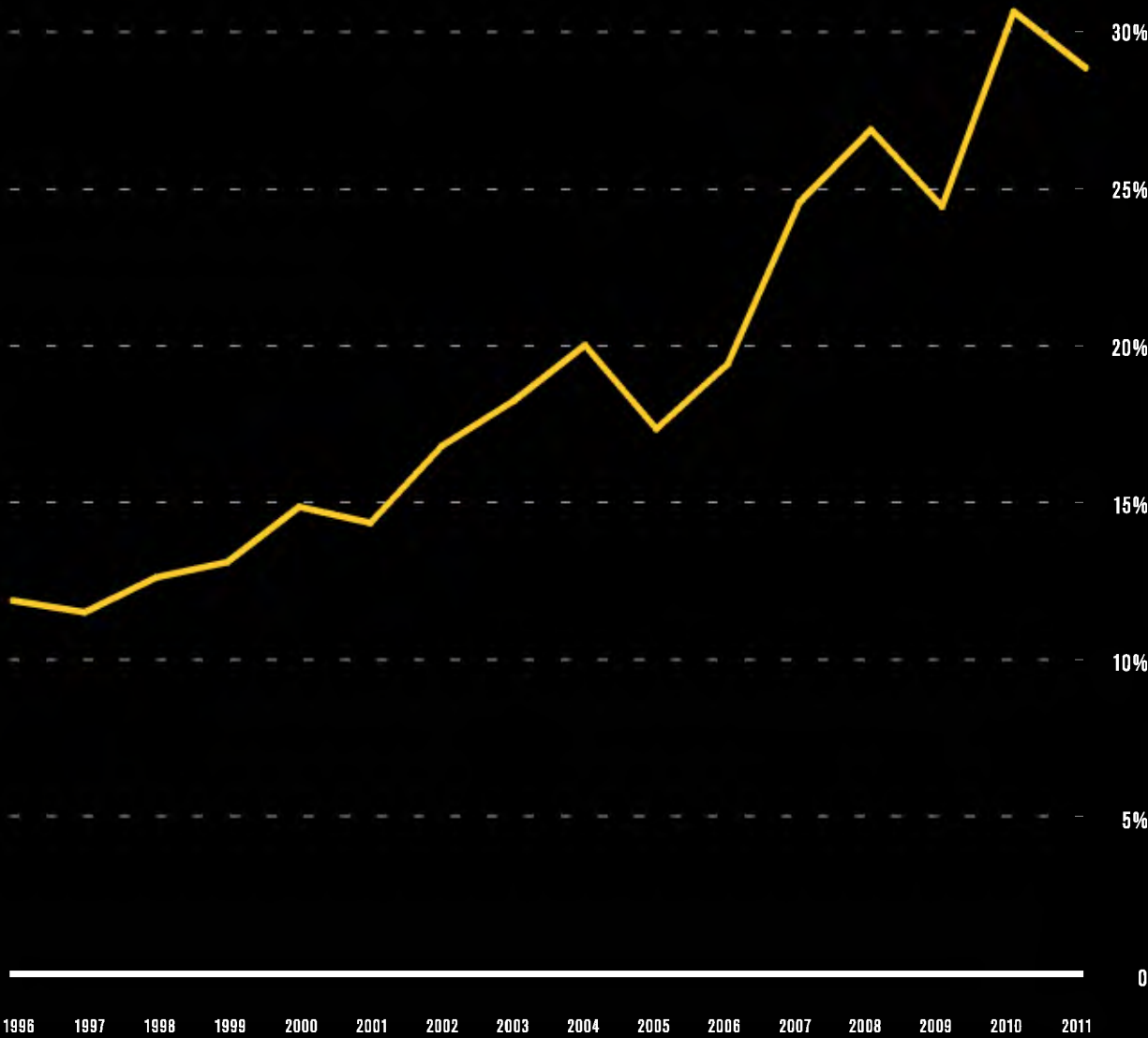
law by President Obama in April of 2012, out of a belief that “small businesses and startups are driving the recovery and job creation.”⁸

Unfortunately, the rate of new startups in the U.S. has fallen dramatically since 2006, and in 2010 reached the lowest rate in 30 years of recorded data.⁹ But even as the overall startup rate declines, immigrant entrepreneurs are playing an increasingly important role in new-business creation across the United States, and many are stepping up to fill that role at a crucial time for our economy.

KEY FINDINGS

- The business startup rate of immigrants has increased by more than 50 percent since 1996, while the business startup rate of the native-born has decreased by 10 percent over the same time period.
- 28 percent of all new small businesses started in the United States in 2011 were founded by immigrants.
- Immigrants are now more than twice as likely to start a business as their native-born counterparts.

28% OF U.S. SMALL BUSINESSES STARTED IN 2011
WERE FOUNDED BY IMMIGRANTS
CURRENT POPULATION SURVEY (1996-2011)



U.S. Census data makes clear that we are increasingly relying on immigrant entrepreneurs to drive new business growth in America. Twenty-eight percent of all new businesses started in the United States in 2011 had immigrant founders. Not only does this number far outpace the immigrant share of the U.S. population (12.9 percent) and the U.S. workforce (16.3 percent), but it also represents a substantial jump over the role immigrant entrepreneurs played in the U.S. just 15 years earlier. In 1996 immigrant entrepreneurs started 15 percent of all new businesses in America, which exceeded their share of the population at the time (roughly 9 percent¹⁹). While some of the growth experienced from 1996 to 2011 was the result of immigrants' increasing share of the workforce and population, most of the growth was due to the fact that immigrants are becoming increasingly entrepreneurial. In 1996 the business-formation rate for immigrants was 360 businesses started per month for every 100,000 immigrants. By 2011 this number had jumped to 550 businesses per month for every 100,000 immigrants, an increase of more than 50 percent.

An increase in the business-formation rate of immigrants could not have come at a better time, considering that the native-born population became less likely to start a business over the 15-year period from 1996 to 2011. The native-born business formation rate declined 10 percent during that period, dropping from 300 new businesses per month per 100,000 native-born to just 270 new businesses monthly. So while immigrants were 20 percent more likely to start a business in 1996, their increasing business-formation rate and the declining native-born business-formation rate meant that by 2011, immigrants were more than twice as likely to start a business as the native-born.

ROHIT ARORA

HELPING MORE ENTREPRENEURS ACHIEVE THE AMERICAN DREAM

Rohit Arora, an immigrant entrepreneur from India, noticed something surprising in the mid-2000s, when he was working at Deloitte Consulting in New York City: Despite small businesses being among banking institutions' most profitable loan clients, many entrepreneurs and small business owners from South Asia and India seemed to be having trouble securing bank loans—even though such entrepreneurs boasted low default rates. In some less desirable neighborhoods, the problem was particularly acute, inhibiting the success of local businesses like gas stations, grocery stores, and medical practices. "Like any global entrepreneur," Arora says, "I wanted to do something that would have a big impact." So in 2007, Arora and his brother Ramit, who had long dreamed of founding a business together, started Biz2Credit, a New York City-based firm that helps match small business owners with banking loans, credit reports, and other financial products.

Much like Arora imagined, his company is already dramatically changing the way many immigrant entrepreneurs access bank loans. Biz2Credit's online platform lets small business owners—both immigrants and non-immigrants—upload information online that can be viewed by the company's nationwide network of more than 1,000 financial institutions. Monthly subscribers are also able to tap into additional benefits like financial advice or in-person meetings with Biz2Credit's loan specialists.

Arora says that by connecting small businesses with the capital they need to expand, Biz2Credit has contributed to the creation of more than 11,000 new jobs since its founding in 2007. The firm is on target this year to facilitate \$600 million in new business loans, up from \$200 million just two years ago. "The work," Arora says, "is incredibly fulfilling."

The company has also created its own jobs. Biz2Credit currently employs about 25 people in the United States, many of them highly experienced loan specialists, and the business continues to expand. Arora, a native of Delhi, says he's proud of what he has built in the United States, a country he moved to in 2003 to pursue an MBA degree at Columbia University. But he frequently meets would-be immigrant entrepreneurs, however, who head home after being unable to secure visas. "Our business has created real opportunities for people in America," Arora says, "but many entrepreneurs never have that chance."¹¹

These two factors—the increase in entrepreneurialism of immigrants combined with the decrease in entrepreneurialism of the native-born—resulted in immigrants owning a growing share of all businesses in America. In the year 2000, when immigrants accounted for 11.1 percent of the U.S. population, they owned 12 percent of all U.S. businesses, roughly equal to their share of the population. But by 2010, when the immigrant share of the U.S. population had risen to 12.9 percent, their share of business ownership greatly exceeded it, and they left the decade owning a full 20 percent of all U.S. businesses.



THREE

IMMIGRANT-OWNED FIRMS DRIVE THE U.S. EXPORT ECONOMY

Perhaps the part of the economy benefitting most from the increased prominence of immigrant-started U.S. businesses has been U.S. exports. Over the past three decades, exports as a percentage of GDP have increased by 20 percent, growing from 10.1 percent to 12.6 percent of GDP,¹² and the value of U.S. exports has increased by 60 percent in the last decade alone.¹³

This is important because, as think tanks like the CATO Institute have argued, exports are a good proxy for the state of our economy and job growth.¹⁴ When exports increase, so do economic output and job creation. When they decrease, our economy tends to shrink and we tend to shed jobs. In 22 of the 25 years from 1983 to 2007, GDP, trade, and job creation all increased together or decreased together.¹⁵ Increasing exports helps alleviate the large U.S. trade imbalance with the rest of the world and, more importantly, helps create U.S. jobs. By 2008, there were more than 10 million jobs in the United States supported by exports.¹⁶ And these exports are driving the recent, limited growth of the U.S. economy. While exports account for only about one-eighth of the nation's economy, they have accounted for about half of the nation's economic growth in recent years.¹⁷

Worryingly, exports have declined in recent years. According to the Bureau of Labor Statistics, U.S. exports fell 2.1 percent between June 2011 and June 2012, the largest yearly decline since the period right after the stock market crashed, October 2008 to October 2009.¹⁸ Fortunately, immi-

grant-owned businesses helped cushion this fall. As the economists Giovanni Peri and Francisco Requena-Silvente have shown, "[t]hrough business and social networks, expatriates increase the diffusion of information and reduce the cost of doing business with their 'mother' country."¹⁹ To the extent that immigrant-owned businesses can export to their home countries or elsewhere, they can help stem the decline in U.S. exports, expand total revenues coming into the country, and create jobs for American workers.

The data establishes that immigrant-owned firms have a powerful role in promoting the U.S. export economy. Immigrant-owned businesses are more than 60 percent more likely to export than are non-immigrant owned businesses. And this is not surprising. Immigrants often face lower barriers of entry to foreign markets because they have established networks in their home countries, an understanding of local markets, and shared languages and culture.²⁰ Only 4.4 percent of non-immigrant firms export, compared with 7.1 percent of immigrant firms. For high-exporting companies, immigrants play an even more dominant role. While just 1.2 percent of non-immigrant-owned firms export more than 20 percent of their sales, 3.2 percent of immigrant-owned firms do, making immigrant firms more than two and a half times more likely to be high-exporting companies.

KEY FINDINGS

- Immigrant-owned businesses are more than 60 percent more likely to export than non-immigrant owned businesses.
- Immigrant-owned businesses are more than two and a half times more likely to be high-exporting companies.

METTA MURDAYA

BRINGING THE INGREDIENTS OF HOME TO THE BEAUTY BUSINESS

Metta Murdaya, the co-founder of the beauty firm Juara Skin-care, says she's always had an appreciation for the unique virtues of Eastern and Western culture. Born in Indonesia, her parents decided to send her to live with an aunt in America when she was just seven years old, hoping she'd receive a better education and more opportunities in the United States.

Murdaya says she loved American culture and quickly acclimated, but she also went back to Indonesia to visit her family each summer, developing a fondness for many of the health tonics, flowers, and body treatments so ubiquitous there. "It's a culture with an innate understanding of beauty traditions," Murdaya explains. "I was intrigued by the rituals they've developed over hundreds of years."

It wasn't until after she obtained an MBA degree, however, that Murdaya saw her fascination as the seed of a potential business idea. In 2004, intent on breaking from their corporate jobs, she and three female friends founded Juara Skincare, a company that uses the ingredients and remedies commonly found in Indonesia and Bali — such as candlenut and turmeric—to make organic, all-natural beauty products like face masks, perfumes, and body scrubs.

The company launched with just three products, and Murdaya says one of her partners trekked out in the snow to convince the first store to carry their brand, a small pharmacy chain in New York City. Within a year, the high-end Los Angeles boutique Fred Segal was carrying Juara. Today, Murdaya says more than 100 stores in the U.S. and Canada stock the company's 30-product line, which has also appeared on the QVC shopping network. It's a fitting result for Juara — a company whose name literally means "winner" or "champion" in Indonesian.

Murdaya says that just as her immigrant experience helped her found the company, it will also help it grow. Immigrant-owned businesses are more than 60 percent more likely than non-immigrant owned firms to export their goods and services, and Juara is certainly no exception. "As an immigrant," Murdaya says, "you always view the world as your marketplace, instead of the city or country you happen to be in." From the beginning, her team made sure all their ingredients were compliant with European Union standards. And later this year, Murdaya says the company's products will begin to appear in South America and Indonesia for the first time.²³

Data on the exports of immigrant-owned firms were not collected until 2007,²¹ so the extent to which we are dependent on the growth in exports from these firms cannot be precisely made. But the data do show that immigrants are increasingly starting businesses and that those businesses are far more likely to export. And that means that policy makers need to think about immigrant-owned firms when they think about reviving our export economy. America was the world's leading exporter for the half-century after World War II, until surpassed early this century by Germany and more recently by China.²² If America is again to lead the world in exports, immigrant entrepreneurs — with knowledge of, and access to, foreign markets— will need to play a crucial role.

IMMIGRANT SHARE OF EXPORT ECONOMY: IMMIGRANTS ACCOUNT FOR A HIGHER PERCENTAGE OF HIGH-EXPORT COMPANIES

SPECIAL TABULATIONS FROM SURVEY OF BUSINESS OWNERS (2007)

PERCENTAGE OF TOTAL SALES EXPORTED OUTSIDE OF THE U.S.	PERCENT OF FIRMS THAT ARE OWNED BY IMMIGRANTS
None	12.7%
Less than 1%	11.1%
1% to 4%	14.7%
5% to 9%	17.1%
10% to 19%	20.2%
20% to 49%	24.8%
50% to 99%	35.1%
100%	50.5%
Total Reporting	13.4%

Note: The sample includes firms that are classified by the IRS as sole proprietorships, partnerships, 1120 corporations, or employers, and that have sales of \$1000 or more. Excludes publicly held and other firms not classifiable by owner status.



IMMIGRANT-OWNED BUSINESSES GENERATE SUBSTANTIAL BUSINESS INCOME AND REVENUE

The toll that the recession took on our GDP and our national fiscal health was severe. The U.S. government estimates that the GDP shrank by more than eight percent in the last quarter of 2008 and an additional four percent in the first quarter of 2009.²⁴ To put that in context, it has been 50 years since the GDP shrank by four percent or more in two successive fiscal quarters.²⁵ U.S. GDP has recovered slowly since, but our fiscal situation has remained unstable. Until 2008, the U.S. had never before run a budget deficit of \$1 trillion. Since 2008, the U.S. budget deficit has exceeded \$1 trillion in every single year, according to the Congressional Budget Office.²⁶ When the loss of tax revenues, the spending and tax cuts included in the stimulus, the bank bailouts, and other recession-related expenses are taken into account, the recent recession added an estimated \$4.2 trillion to the federal deficit.²⁷

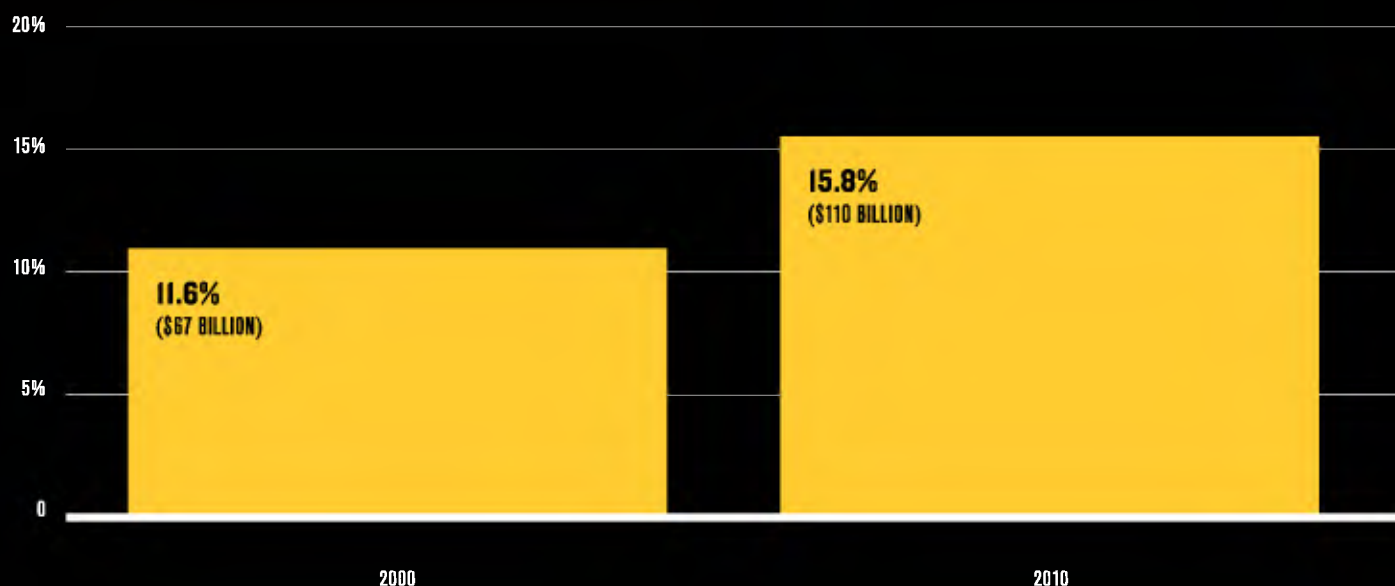
Our GDP and our fiscal health present worrisome economic trends, but the data from this report plainly show that immigrant business owners have helped prevent a far worse economic picture. While immigrants are not starting massive companies at the same rate as their native-born counterparts, they are far more prolific in starting small businesses. And these businesses collectively generated \$779.8 billion in revenue and \$109.1 billion in income in 2010,²⁸ strengthening U.S. GDP, paying taxes to help balance the budget, and creating ripple effects throughout the broader economy due to higher consumption of goods and services by the companies and their employees.²⁹

KEY FINDINGS

- Immigrant-owned businesses generated more than \$775 billion in sales and more than \$100 billion in income in 2010.
- The \$109 billion in business income generated by immigrant-owned firms in 2010 was a 60 percent increase over 2000. This growth greatly outpaced the increase in business income generated by native-owned firms, whose 14 percent rise failed to outpace inflation.

BUSINESSES INCOME GENERATED BY IMMIGRANTS (2000 VS 2010)

IMMIGRANT-OWNED BUSINESSES GENERATE A GROWING PERCENTAGE OF ALL BUSINESS INCOME GENERATED IN THE U.S. ECONOMY.



TOTAL SALES FOR IMMIGRANT AND NON-IMMIGRANT OWNED FIRMS SPECIAL TABULATIONS FROM SURVEY OF BUSINESS OWNERS (2007)

OWNERSHIP	NUMBER OF FIRMS	TOTAL SALES (THOUSANDS)
Immigrant (majority foreign-born)	1,798,541	\$779,833,279
Non-immigrant (majority native-born)	11,578,280	\$7,047,737,009
Total immigrant and non-immigrant	13,376,821	\$7,827,570,287
Equally foreign- and native-born	244,070	\$102,760,238
Foreign-born status indeterminate	12,673,969	\$3,019,131,351

Note: The sample includes firms that are classified by the IRS as sole proprietorships, partnerships, 1120 corporations, or employers, and that have sales of \$1,000 or more. Excludes publicly held and other firms not classifiable by owner status.

Data on income from immigrant-owned businesses are available for both 2000 and 2010,³⁰ allowing for a comparison of how our economic dependence on immigrant-owned businesses is changing over time. And the data show that during the last decade, when native-owned business income stagnated and even declined in inflation-adjusted dollars, immigrant-owned business income soared.

Between 2000 and 2010, the business income generated by native-owned firms increased from \$510.8 billion to \$584.1 billion, an increase of 14.4 percent and lagging far behind the 26.6 percent increase that would have been required to keep pace with inflation.³¹ The income of immigrant-owned businesses, however, grew from \$67.0 billion in 2000 to \$109.1 billion in 2010, an increase of more than 60 percent that far outpaced inflation. In fact, this jump of \$42.1 billion in business income from immigrant-owned businesses accounted for a full 36 percent of the entire growth in business income in the United States during that decade. As a result, the share of national business income from immigrant-owned businesses increased, rising from 11.6 percent of national business income at the beginning of the decade to 15.8 percent by the decade's end.³²

Immigrant-owned businesses continue to have lower average incomes per business than their native-born counterparts – \$49,779 in income on average per year, compared with \$62,695 for non-immigrants—but businesses started by several specific immigrant groups, including those from India (\$91,237 average annual income), Iran (\$83,555), Canada (\$83,132), Germany (\$66,678), and Italy (\$65,004), significantly outperform the national average.



IMMIGRANT-OWNED BUSINESSES CREATE MILLIONS OF JOBS AND PAY BILLIONS OF DOLLARS IN EMPLOYEE SALARIES

The U.S. economy lost nearly 9 million jobs during the recent recession.³³ Unemployment reached 10 percent, a figure seen in only one other brief period over the last sixty years.³⁴ Long term unemployment – defined as persons out of works for 27 weeks or more– reached 4.4 percent in early 2009, dwarfing its previous high of 2.6 percent in the early 1980s.³⁵ And even though some jobs have returned, more than 12 million Americans are still unemployed, and millions more left the labor force entirely.³⁶

One fact, however, is abundantly clear. But for the recent increase in business startup activity among immigrants, the economic situation facing millions of Americans would be markedly worse. Immigrants are starting companies that are smaller on average than the native-born in terms of payroll and number of employees, but they are starting these companies in increasingly large numbers and these small companies collectively create millions of jobs and pay out billions upon billions of dollars in payroll to workers in

America.³⁷ One out of every 10 workers at privately-owned U.S. companies³⁸ now works at an immigrant-owned company. While immigrant-owned businesses with employees each hire eight employees on average, as compared to 12 employees hired by businesses owned by the native-born – millions of workers in America have their jobs today because of immigrants. Altogether, immigrant-owned businesses have collectively created four million jobs that exist today in the United States.

Similarly, although the average payroll generated by immigrant businesses is smaller than that of businesses owned by the native-born – \$252,758 on average for immigrant-owned businesses compared with \$428,546 for businesses owned by the native-born – their aggregate contribution to the U.S. payroll is massive in scale. Immigrant-owned businesses pay out more than \$126 billion per year in payroll.

KEY FINDINGS

- One in every 10 people employed at a privately-owned U.S. company works at an immigrant-owned firm.
- Immigrant-owned businesses pay out \$126 billion in payroll per year.

SERGIO BERMUDEZ

BUILDING A FAMILY GROCERY EMPIRE CATERING TO MEXICAN TASTES

Sergio Bermudez, the President and CEO of the El Mezquite Market chain in New Mexico, emigrated from the Mexican state of Sonora with his five siblings in the late 1980s and early 1990s. They quickly found work in a wide array of construction jobs in Arizona — including concrete pouring and steel working. But observing some cousins who owned a meat market in Phoenix, the siblings began dreaming of having their own store.

By 1998, they'd sold off family cars and borrowed money from family members to buy a small, 3,000-square-foot space in Albuquerque, New Mexico. They renovated it themselves — commuting in from Arizona on nights and weekends — and bought used equipment on monthly installments. "It was hard," Bermudez says. But Bermudez says his family learned the virtues of hard work in Mexico, a country with little social support. "We're used to an environment where if you don't work hard, you don't eat."

And their hard work paid off. The first El Mezquite store, which sold thin Mexican cuts of meat, as well as imported delicacies like goats' milk candy, tomatillo sauces, and fresh papayas, did so well with the local Latino population that the family was able to open a second store by the end of 1998. Today, their six large markets, decorated with piñatas and dotted throughout central New Mexico, serve 40,000 customers per week and provide a wide array of services needed by their largely Latino customer base. On-site restaurants let customers sit down for a leisurely lunch, and phone cards are sold in-house. "People are very comfortable with us, and they trust us," Bermudez says. "That's incredibly important to our success."

Today, El Mezquite is one of the fastest growing Latino immigrant-owned businesses in New Mexico, employing a staff of more than 220 people. "I never would've imagined we'd grow so fast," says Bermudez, who never formally trained in the grocery business. His success has inspired others in the community. Although just two Latino-focused grocery stores existed in Albuquerque when his store opened, now there are at least 18. He and his siblings are now trying to help the next generation. In the last four years, his company has provided scholarships to 54 immigrant students attending the University of New Mexico.³⁹

EMPLOYMENT AND PAYROLL FOR IMMIGRANT AND NON-IMMIGRANT OWNED FIRMS SPECIAL TABULATIONS FROM SURVEY OF BUSINESS OWNERS (2007)

OWNERSHIP	NUMBER OF EMPLOYER FIRMS	TOTAL EMPLOYMENT	TOTAL PAYROLL (THOUSANDS)
Immigrant (majority foreign-born)	501,973	3,997,977	\$126,877,578
Non-immigrant (majority native-born)	3,049,698	36,426,585	\$1,306,936,752
Total immigrant and non-immigrant	3,551,671	40,424,562	\$1,433,814,330
Equally foreign- and native-born	74,006	642,138	\$21,106,032
Foreign-born status indeterminate	1,564,291	15,559,855	\$485,652,582

Note: The sample includes firms that are classified by the IRS as sole proprietorships, partnerships, 1120 corporations, or employers, and that have sales of \$1000 or more. Excludes publicly held and other firms not classifiable by owner status.



IMMIGRANT-OWNED BUSINESSES POWER MANY SECTORS OF THE AMERICAN ECONOMY

As important as the frequency with which immigrants are starting businesses is the diversity of fields in which they are starting them. Past research has highlighted the role that immigrant entrepreneurs have had in isolated sectors of the economy such as technology,⁴⁰ but the data from this report make clear that immigrant entrepreneurs are founding companies all over the economy, particularly in sectors that the U.S. government expects to be the fastest growing in the next decade.⁴¹

In seven of the eight industries that the U.S. Bureau of Labor Statistics estimates will grow fastest this decade, immigrants start an outsized share of all new companies. From 2007 to 2011, immigrants founded 28.7 percent of health care and social assistance companies,⁴² 25.4 percent of professional and business services, 31.8 percent of construction firms, 29.1 percent of retail trade companies,⁴³ 23.9 percent of leisure and hospitality companies, 28.7 percent of educational services,⁴⁴ 28.2 percent of other services,⁴⁵ and 29.4 percent of transportation and utilities firms.

In each of these sectors, immigrants are founding an even larger share of new companies than the share they currently own in them. For instance, while immigrants already own an impressive 17 percent of businesses in construction, they started 31.8 percent of all new construction businesses from 2007 to 2011. Unless immigrant businesses in construction fail at a much higher rate than those of their native-born counterparts — data that were not available for the purposes of this report⁴⁶ — their share of construction companies will only increase. Similar patterns are observed across the top growth sectors — from wholesale and retail trade to transportation and utilities, to educational and health services — all fields where immigrants in recent years have been responsible for nearly 30 percent of all new businesses start ups, far higher than their current share of business ownership.⁴⁷

KEY FINDINGS

Immigrants start more than 25 percent of all businesses in seven of the eight sectors of the economy that the U.S. government expects to grow fastest over the next decade.

Immigrant-owned businesses generate more than 20 percent of all income in the retail trade; transportation; health care and social assistance; and accommodation, recreation and entertainment sectors.

OPEN FOR BUSINESS

17

IMMIGRANTS CREATED AN OUTSIZE SHARE OF BUSINESSES IN THE FASTEST GROWING SECTORS OF THE ECONOMY

CURRENT POPULATION SURVEY (2007–2011)

LEISURE AND HOSPITALITY

23.9%

PROFESSIONAL AND BUSINESS SERVICES

25.4%

OTHER SERVICES

28.2%

HEALTH CARE AND SOCIAL ASSISTANCE

28.7%

EDUCATIONAL AND HEALTH SERVICES

28.7%

WHOLESALE AND RETAIL TRADE

29.1%

TRANSPORTATION AND UTILITIES

29.4%

CONSTRUCTION

31.8%

0%

50%

100%

NUMBER OF NEW IMMIGRANT BUSINESS OWNERS PER MONTH BY INDUSTRY

CURRENT POPULATION SURVEY (2007-2011)

INDUSTRY	NEW IMMIGRANT BUSINESS OWNERS			ALL NEW BUSINESS OWNERS	
	NUMBER	PERCENT OF IMMIGRANT TOTAL	PERCENT OF U.S. INDUSTRY TOTAL	NUMBER	PERCENT OF U.S. TOTAL
All industries	138,697	100.0%	24.9%	556,470	100.0%
Agriculture and mining	1,245	0.9%	2.7%	46,107	8.3%
Construction	38,872	28.0%	31.8%	122,279	22.0%
Manufacturing	2,742	2.0%	16.6%	18,490	3.0%
Wholesale and retail trade	16,208	11.7%	29.1%	55,783	10.0%
Transportation and utilities	5,856	4.2%	29.4%	19,889	3.6%
Information	1,466	1.1%	16.5%	8,857	1.6%
Financial Activities	5,624	4.1%	16.0%	35,144	6.3%
Professional and business services	28,911	20.8%	25.4%	113,598	20.4%
Educational and health services	18,265	13.2%	28.7%	63,547	11.4%
Leisure and hospitality	8,848	6.4%	23.9%	36,963	6.6%
Other services	10,661	7.7%	28.2%	27,812	6.8%

Notes: The sample includes individuals who do not own a business in the first survey month and report starting a business in the second survey month with 15 or more hours worked per week. All reported estimates use sample weights provided by the CPS.

TASHITAA TUFAA

ACHIEVING A CHILDHOOD DREAM BY BUILDING A SUCCESSFUL TRANSPORTATION COMPANY

Tashitaa Tufaa grew up on a farm in Ethiopia with 13 brothers and sisters and a dream of coming to America. "It was such a powerful country in our minds," Tufaa says, "an almost imaginary place where people were safe and achieving their dreams." By the age of 24, Tufaa had immigrated to the U.S. as a political refugee. Despite holding a college degree in history, Tufaa says he was thrilled when he got his first job working as a hotel dishwasher making just \$5.35 per hour. In the 1990s and early 2000s, he was often employed at multiple places at once, doing everything from school disciplinary work to taxi driving. "Working eight hours a day," he says, "that was nothing to me." The hard work has paid off, and Tufaa is now a transportation entrepreneur whose Minnesota-based company, Metropolitan Transportation Network, will employ 350 people during the upcoming school year. The firm also owns 300 school buses.

Tufaa took the first steps to achieving his dream of owning a company in 2003 when he began a tireless campaign going door-to-door, trying to convince Minneapolis-area hospitals and schools to let his newly formed, one-person company shuttle needy patients or students back and forth from health care facilities or schools. "Some people simply laughed at me," he recalls, "but one person was willing to take a chance." That person, a school district transportation director, agreed to let Tufaa use his taxi cab to drive three homeless students to school who couldn't fit into the normal bus schedule. Eight years later, that one car company has turned into a growing business with nearly \$8 million in annual revenues.

Tufaa credits his entrepreneurial success to his high standards and focus on his employees. "We want everyone in our company to be treated the same — from top management down to drivers," Tufaa says. He says his driving jobs are well paid for the industry, and he himself still drives one van of special needs children to school daily — just to show his workers "driving isn't a leftover, undesirable job." He's particularly proud of having taken a chance on a young, inexperienced war veteran who applied for a job as a mechanic several years ago — that person is his head mechanic today. "America is a place where even the poorest children can succeed," Tufaa says. "I wanted to pay back this society for all it has given me."⁴⁸

Similar to the story of immigrant businesses generally, the businesses that immigrants are starting in these eight sectors tend to be smaller than those of their native-born counterparts but these businesses collectively generate enormous amounts of business income. Immigrant-owned businesses in professional services and health care and social assistance each generated more than \$20 billion on average per year from 2006 to 2010. Immigrant-owned businesses also generated substantial business income in construction (more than \$16 billion in business income per year), retail trade (more than \$11 billion), finance (more than \$9 billion), accommodation, recreation, and entertainment (more than \$9 billion), transportation (more than \$6 billion), wholesale trade (more than \$5 billion), and manufacturing (just shy of \$5 billion). In many cases, immigrant-owned businesses contribute more than 20 percent of all income in the sector, including sectors as diverse as retail trade; transportation; health care and social assistance; and accommodation, recreation, and entertainment. The billions upon billions of dollars generated in these industries generate tax revenue, higher payroll, more employment, and increased consumption for the economy.

It is evident that immigrant-owned businesses are going to play a central role in economic growth in the coming decade. Economic growth is predicted to depend, in part, on these sectors, and in each of these sectors immigrants play an increasingly important part in starting new businesses and generating income. Taken together, these companies will earn billions upon billions of dollars, generate new tax revenue, expand payroll, create new jobs, and increase consumption across the economy.



IMMIGRANTS PUNCH ABOVE THEIR WEIGHT IN STATES ACROSS THE COUNTRY

The impact of the businesses that immigrants are starting is felt all over the country. In states that are large enough for data to be available, immigrants are starting businesses at rates that greatly exceed their share of the population.

In California, immigrants make up 27.2 percent of the population⁴⁹ but own 36.6 percent of all businesses – 676,537 in total – and start 44.6 percent of all new businesses.⁵⁰ The same can be said for New York, where immigrants make up 22.2 percent of the population, own 31.2 percent of businesses, and are now starting 42.0 percent of new businesses. Similar stories exist for states like New Jersey (immigrants make up 21.0 percent of population, own 28.6 of businesses, and start 35.2 percent of new businesses), Florida (19.4 percent of population; own 29.7 percent of businesses, and start 36.7 percent of new businesses), Texas (16.4 percent of population; own 24.9 percent of businesses, and start 31.3 percent of new businesses), Illinois (13.7 percent of population; own 20.3 percent of businesses, and start 32.1 percent of new businesses), Arizona (13.4 percent of population; own 19.6 percent of businesses, and start 31.5 percent of new businesses), and Georgia (9.7 percent of population; own 15.6 percent of businesses, and start 29.5 percent of new businesses). Provided that the rate that immigrant-owned businesses fail does not dramatically exceed the failure rate for businesses owned by the native-born – data that is not available for this report⁵¹ – the findings suggests that immigrant business-ownership rates will only continue to increase.

To provide context for what this increase in business generation will mean to the income generated by these states, consider that immigrant-owned businesses already produce more than \$34 billion per year in California alone, constituting 28.1 percent of all business income produced in the state and 4.2 percent of all business income in the United States. In Florida the total income of immigrant business owners represents nearly one-fourth of all business income in the state. And in New York, New Jersey, and Hawaii, immigrant-owned businesses already produce 20 percent or more of the state's income.

TOM SZAKY

TURNING TRASH INTO TREASURE

Tom Szaky, a green energy entrepreneur, credits his immigrant experience with helping him see a business opportunity few others did – and having the motivation to pursue it. Szaky, who was born in Hungary, fled the country at the age of four with his family. Settling in Toronto, Canada, Tom says he and his parents were quickly amazed by the things they saw neighbors casually throwing out in the trash, including fully-functioning televisions, a true luxury in a country as poor as Hungary. Away from the Iron Curtain, young Tom also quickly developed an admiration for the success that self-made entrepreneurs could achieve in the Western world. "The idea of going from nothing to everything in a lifetime," he says, "was inspiring to me."

So it's little surprise that Tom soon began exploring entrepreneurship. By age 14, he had a small but successful graphic design business. Five years later, while a sophomore in college in the United States, Szaky dropped out of college to run TerraCycle, a New Jersey-based company he founded that recycles materials previously viewed as unrecyclable. It also upcycles other items of trash – turning refuse like candy and gum wrappers into products like backpacks, stereo speakers, and pencil cases. The 120-person company, which collects trash in 22 countries and two-thirds of public schools in America, says it has rescued three billion pieces of garbage that would otherwise be in a landfill. It projects it will earn \$18.5 million in revenues this year.

Szaky says he sees much bigger things in store. This winter, TerraCycle is planning to launch a recycling program that will allow dirty diapers to be recycled into park benches – a powerful idea considering that in the U.S. alone disposable diapers account for 3.7 million tons of municipal waste each year.⁵² Szaky says he sees a multibillion-dollar market in his unique corner of the recyclables industry. "I want to wake up at the end of my life and know I've created a truly substantial business," Szaky says. The way things are going, he's already well on his way to achieving that dream.⁵³

OPEN FOR BUSINESS

21

IMMIGRANTS ARE DRIVING BUSINESS AND BUSINESS GROWTH IN MANY STATES

CURRENT POPULATION SURVEY (2007-2011) AND AMERICAN COMMUNITY SURVEY (2006-2010)

CALIFORNIA



NEW YORK



FLORIDA



NEW JERSEY



ILLINOIS





THE IMMIGRANTS STARTING BUSINESSES IN THE UNITED STATES COME FROM ALL OVER THE WORLD

There is no one country of origin for the immigrants driving new-business creation in America. The largest number of immigrants starting new businesses come from Mexico, whose expatriates start more than 50,000 new U.S. businesses every month. There are now more than 570,000 U.S. businesses that are owned by immigrants from Mexico, constituting more than 1 in every 25 businesses in this country. But the immigrants starting new businesses in the United States hail from all over the world. Immigrants from Guatemala, Cuba, Korea, El Salvador, India, Dominican Republic, Honduras, Vietnam, and China all start more than 2,500 U.S. businesses per month.²⁴ More than 20 percent of Koreans, Iranians, Brazilians, and Italians currently living in the United States own a business, compared to 9.6 percent of native-born Americans. Immigrants from Poland (15.6 percent of whom own a business), Cuba (14.8 percent), Canada (14.2 percent), Vietnam (14.0 percent), Germany (13.3 percent), Colombia (13.1 percent), Peru (12.1 percent), Honduras (11.2 percent), Guatemala (10.6 percent), and China (10.0 percent) all own businesses at higher rates than their

native-born counterparts. This diversity opens up new economic opportunities, bringing outside knowhow to the U.S. and providing language skills and cultural understanding that allow American businesses to grow and service customer bases both here and abroad.

The businesses that these immigrant groups start are generating billions of dollars in income for the U.S. economy. Immigrants from Mexico provide the largest contribution to total U.S. business income at nearly \$17 billion per year (2.1 percent of total business income), but immigrants from India (\$9.1 billion in business income), Korea (\$7.1 billion), Canada (\$4.8 billion), Vietnam (\$4.3 billion), China (\$3.9 billion), Iran (\$3.8 billion), Cuba (\$3.7 billion), the Philippines (\$3.3 billion), Germany (\$2.4 billion), El Salvador (\$2.2 billion), and Poland (\$2.2 billion) also make large contributions to U.S. business income.

NUMBER OF NEW BUSINESS OWNERS PER MONTH BY COUNTRY OF ORIGIN
CURRENT POPULATION SURVEY (2007-2011)

GROUP	NEW BUSINESS OWNERS		BUSINESS FORMATION RATE	
	NUMBER PER MONTH	PERCENT OF U.S. TOTAL	PERCENT	NUMBER PER 100,000
U.S. Total	556,470	100.00%	0.32%	318
U.S.-Born Total	417,773	75.08%	0.28%	283
Immigrant Total	138,697	24.92%	0.51%	507
Mexico	53,963	9.70%	0.62%	624
Guatemala	5,245	0.94%	1.08%	1079
Cuba	4,438	0.80%	0.56%	557
Korea	4,429	0.80%	0.75%	752
El Salvador	4,262	0.77%	0.51%	513
India	3,689	0.66%	0.28%	282
Dominican Republic	3,328	0.60%	0.55%	553
Honduras	3,068	0.55%	0.92%	920
Vietnam	3,029	0.54%	0.39%	391
China	2,641	0.47%	0.26%	263

Notes: The sample includes non-business owners who do not own a business in the first survey month. The total sample size is 3,306,803. Business formation is defined as those individuals who report starting a business in the second survey month with 15 or more hours worked per week. The reported immigrant groups represent the largest 10 groups based on the number of new businesses.

NUMBER OF BUSINESS OWNERS BY COUNTRY OF ORIGIN
AMERICAN COMMUNITY SURVEY (2006-2010)

GROUP	BUSINESS OWNERS		TOTAL WORKFORCE		
	NUMBER	PERCENT OF U.S. TOTAL	NUMBER	PERCENT OF U.S. TOTAL	BUSINESS OWNERSHIP RATE
U.S. Total	13,385,470	100.00%	136,472,990	100.00%	9.8%
U.S.-Born Total	10,950,850	81.81%	114,299,860	83.75%	9.6%
Immigrant Total	2,434,620	18.19%	22,173,130	16.25%	11.0%
Mexico	570,170	4.26%	6,754,700	4.95%	8.4%
Korea	123,770	0.92%	535,750	0.39%	23.1%
India	99,830	0.75%	1,056,150	0.77%	9.5%
Vietnam	98,950	0.74%	706,630	0.52%	14.0%
China	75,530	0.56%	757,010	0.55%	10.0%
Cuba	75,050	0.56%	506,410	0.37%	14.8%
El Salvador	73,540	0.55%	767,480	0.56%	9.6%
Canada	57,650	0.43%	406,900	0.30%	14.2%
Philippines	55,450	0.41%	1,095,930	0.80%	5.1%
Guatemala	52,840	0.39%	496,900	0.36%	10.6%
Colombia	49,670	0.37%	379,490	0.28%	13.1%
Brazil	47,060	0.35%	224,290	0.16%	21.0%
Iran	45,330	0.34%	186,150	0.14%	24.4%
Dominican Republic	41,110	0.31%	446,940	0.33%	9.2%
Poland	40,870	0.31%	262,460	0.19%	15.6%
Germany	35,540	0.27%	266,910	0.20%	13.3%
Honduras	32,950	0.25%	293,200	0.21%	11.2%
Jamaica	31,890	0.24%	407,570	0.30%	7.8%
Peru	31,320	0.23%	259,580	0.19%	12.1%
Italy	30,750	0.23%	152,630	0.11%	20.1%

Notes: The sample includes all workers with 15 or more hours worked per usual week. The total sample size is 6,644,017. All reported estimates use sample weights provided by the ACS. The reported immigrant groups represent the largest 20 groups based on the number of business owners.



IMMIGRANTS OF ALL EDUCATION LEVELS ARE CONTRIBUTING TO BUSINESS CREATION AND GROWTH

While much attention has been given to highly-educated immigrant entrepreneurs in the tech and other high-skilled sectors, the fact is that less-educated immigrant entrepreneurs are making an equally important mark on the U.S. economy. More than 37 percent of new immigrant business owners lack a high school diploma, roughly equivalent to the 37 percent of new immigrant business owners who have some college or a college degree. This stands in contrast to native-born new-business owners, only 16.4 percent of whom lack a high school diploma and 54.0 percent of whom have some college or a college degree. To a large degree, this difference

tracks the different educational profile of immigrants and native-born generally.⁵⁵ This data also gives reason to think that immigrant entrepreneurs may have the largest impact on America's most distressed communities. Communities with lower educational attainment levels often have the fewest job opportunities and the highest unemployment rates.⁵⁶ Immigrant entrepreneurs, who frequently move into neighborhoods that have little economic activity⁵⁷ and are far more likely to start a business even when they themselves are less-educated, can play an outsized role in creating new jobs in some of these areas most in need of new economic opportunities.

NUMBER OF NEW IMMIGRANT BUSINESS OWNERS PER MONTH BY EDUCATION LEVEL
CURRENT POPULATION SURVEY (2007-2011)

GROUP	NEW IMMIGRANT BUSINESS OWNERS			TOTAL WORKFORCE	
	NUMBER	PERCENT OF IMMIGRANT TOTAL	PERCENT OF U.S. EDUCATION TOTAL	NUMBER	PERCENT OF U.S. TOTAL
All education levels	188,697	100.0%	24.9%	556,470	100.0%
Less than high school	52,160	37.6%	57.0%	91,470	16.4%
High school graduate	35,160	25.4%	21.3%	164,842	29.6%
Some college	20,438	14.7%	15.0%	136,192	24.5%
College graduate	30,939	22.3%	18.9%	163,966	29.5%

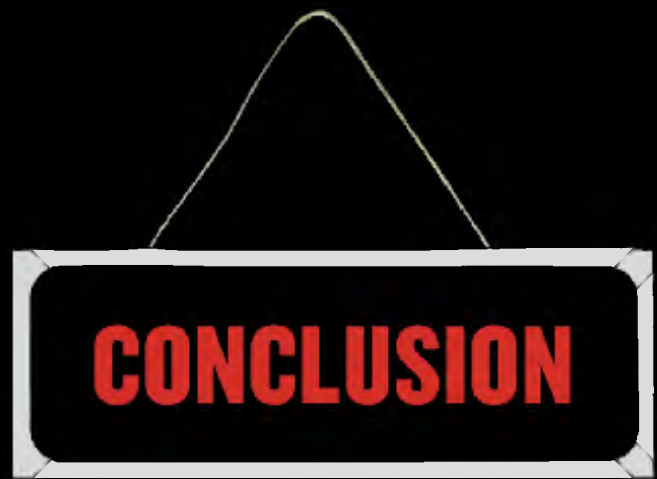
Notes: The sample includes individuals who do not own a business in the first survey month and report starting a business in the second survey month with 15 or more hours worked per week. All reported estimates use sample weights provided by the CPS.

SHUKRI ALI AND MAHAMED MAHAMUD

REVITALIZING DOWNTOWN LEWISTON WITH THE TASTE OF HOME

Shukri Ali and her husband Mahamed Mahamud were realizing a dream when they opened The Taste of Three One Café in Lewiston, Maine in 2008. The couple, both of whom fled Somalia during the chaos of the 1990s, arrived in Lewiston in 2002. By the following year Ali had already begun working double shifts as an interpreter in the community — sometimes putting in as many as 18 hours per day — so that she and her husband, a hospital chef, could open their own restaurant. Five years later, they debuted The Taste of Three One Cafe, a small, homey spot downtown that serves Somali food, as well as Caribbean, East African, and other international fare. “We wanted to create a restaurant where everyone was welcome, a real community space,” Ali says. And they quickly achieved that: By early this year as many as 200 people were cycling through the beloved 15-seat restaurant on its busiest days, enjoying everything from curried goat to spaghetti with muufa, or Somali flatbread.⁵⁸

Ali's story is part of a long history of Somali immigrants in Lewiston, Maine. Somali immigrants began arriving in the community in 2002, and now make up almost one in 10 residents. After some initial community tension — most notably, the decision by an outside white supremacist church to hold a rally protesting the Somali migration in 2003 — immigrants from the war-torn East African country began contributing heavily to Lewiston's economic revitalization and growth in the last five years. Somali-owned businesses now crowd Lisbon Street, a stretch of downtown Lewiston once plagued by high vacancy rates and empty store fronts. “It used to be the kind of place people were afraid to go to at night,” says Ismail Ahmed, who used to work with newly arrived immigrants in the community, “but the Somali businesses changed it.”⁵⁹



Politicians are looking to entrepreneurs to create the companies that are going to help America grow its way out of the recession and create jobs to put the millions of unemployed back to work. As this report shows, immigrant entrepreneurs are central to new-business creation in this country, creating businesses at an increasing rate at a time when the rate of native-born business-generation is declining. Nearly three in every 10 businesses founded in the United States in 2011 was started by an immigrant, and millions of Americans—roughly one in every 10 workers at privately-owned companies — have their jobs today because of immigrant business owners. In addition to creating jobs, the businesses that immigrants start also create revenue to boost our GDP, exports to alleviate our trade imbalance, taxes to fund our deficit, and new consumption that fuels our economy.

So as policy makers consider measures to increase job growth, politicians may disagree on spending more or cutting taxes, protecting or opening markets, or the value of various regulations. But one thing should be beyond argument: any serious plan on job growth must recognize and welcome immigrant entrepreneurs, who in the coming years will play an outsized role across the country and across industries in starting new businesses, creating new jobs, and driving economic growth.

Appendix A. Data and Methodology

ACS: American Community Survey (2006–2010)

This study uses all three of the nationally representative Census Bureau datasets with large enough sample sizes to study immigrant business owners in detail.

Two of the datasets are household surveys – the American Community Survey and the Current Population Survey – and provide information on business ownership, startup activity and business income.

The third dataset is a business-level survey – the Survey of Business Owners – and provides information on business sales, employment, payroll and exports. The datasets also provide detailed information on immigrant owners such as source country, skill level, state of residence, and industry of business.

The primary sample used to examine immigrant business ownership and net business income is the 2006–2010 ACS. The ACS microdata include 11.6 million observations for adults. The sample is large enough to allow the exploration of differences in business income across states, industries, skill-level, and country-of-origin amongst immigrant and native-born business owners.

Using the ACS data, business ownership is determined by the class-of-worker question that refers to the respondent's main job or business activity (i.e., activity with the most hours) at the time of the interview. Business owners are individuals who report that they are 1) "self-employed in own not incorporated business, professional practice, or farm," or 2) "self-employed in own incorporated business, professional practice, or farm." This definition includes owners of all types of businesses—incorporated, unincorporated, employer, and non-employer firms. The samples used in this analysis include all business owners age 18 and over who work 15 or more hours per week at their businesses. To rule out very small-scale businesses, disguised unemployment, or casual sellers of goods and services, only business owners with 15 or more hours worked are included.⁶⁰ Fifteen hours per week is chosen as the cutoff because it represents a reasonable amount of work effort in the business, about two days per week. Note that self-employed business ownership is defined as the individual's main job activity, thus removing the potential for counting side businesses owned by wage-and-salary workers.

CPS: Current Population Survey (2007–2011)

Although research on entrepreneurship is growing rapidly, very few national datasets provide information on recent trends in business formation. This report derives a measure to study immigrant business startup activity from matched data from the 2007-2011 Current Population Surveys (CPS). The measure captures the rate of business creation at the individual owner level. The underlying datasets used to create the entrepreneurship or business formation measure are the basic monthly files of the CPS. Although the CPS is commonly used as cross-sectional data, longitudinal data can be created by linking the CPS files over time. The surveys, conducted monthly by the U.S. Bureau of the Census and the U.S. Bureau of Labor Statistics, are representative of the entire U.S. population and contain observations for more than 130,000 people. Combining the 2007 to 2010 monthly data creates a sample size of 3.8 million adult observations.

Households in the CPS are interviewed each month over a four-month period. Eight months later they are re-interviewed in each month of a second four-month period. Thus, individuals who are interviewed in January, February, March, and April of one year are interviewed again in January, February, March, and April of the following year. The rotation pattern of the CPS thus allows for matching information on individuals monthly for 75 percent of all respondents to each survey. To match these data, the report uses the household and individual identifiers provided by the CPS and removes false matches by comparing race, sex, and age codes from the two months. All non-unique matches are also removed from the dataset. Monthly match rates are generally between 94 and 96 percent, and false positive rates are very low.

The business-formation rate is estimated by first identifying all individuals who do not own a business as their main job in the first survey month, then matching CPS files to determine whether they own a business as their main job (with 15 or more usual hours worked per week) in the following survey month. The business formation rate is thus defined as the percentage of the population of non-business owners who start a business each month. To identify whether they are business owners in each month, the survey uses information on their main job, defined as the one with the most hours worked. Thus, individuals who start side or casual businesses are not counted if they are working more hours on a wage-and-salary job.

SBO: Survey of Business Owners (2007)

Estimates of business ownership and formation rates and of the net business income of owners are available using Census and CPS microdata, but another source of information is provided by business-level data, where the business, rather than the owner, is the focus of the analysis. The main advantage of business-level data is that they typically provide more information on business performance than individual-level data, but the main disadvantage is that they do not include information on the demographic characteristics of the owner.⁶¹ The only large nationally representative business-level data set in which the immigrant status of the owner is identifiable is the 2007 SBO. For the first time since 1992 (then called the Characteristics of Business Owners), the U.S. Census Bureau in 2007 collected information on the immigrant status of business owners in its main database of the ownership characteristics of U.S. businesses. The SBO is conducted by the U.S. Census Bureau every five years to collect statistics that describe the composition of U.S. businesses by gender, race, and ethnicity. The universe for the most recent survey is all firms operating during 2007 with receipts of \$1,000 or more that filed tax forms as individual proprietorships, partnerships, employers or any type of corporation.

The 2007 SBO includes information on whether the business owner is an immigrant which is determined by whether the owner is foreign-born vs. U.S.-born. Following the convention used by the Census Bureau in reporting business statistics by race, immigrant-owned businesses are defined as those with majority foreign-born ownership (51% or more). Similarly, non-immigrant businesses are defined as those with majority U.S.-born ownership (51% or more). Equally-owned firms are also reported in the tables presented below but are not included in calculating the immigrant shares.

The 2007 SBO also includes information on the sales, employment, payroll and exports of the business. Unfortunately, however, only business and employer firm counts by foreign-born status were reported in published reports by the Census Bureau. Instead, the author commissioned the U.S. Census Bureau to conduct special runs using the 2007 SBO that provide information on the sales, employment, payroll and exports of immigrant-owned businesses and non-immigrant owned businesses.⁶²

Appendix B.

NUMBER OF IMMIGRANT BUSINESS OWNERS BY INDUSTRY

AMERICAN COMMUNITY SURVEY (2006-10)

INDUSTRY	IMMIGRANT BUSINESS OWNERS			ALL BUSINESS OWNERS	
	NUMBER	PERCENT OF IMMIGRANT TOTAL	PERCENT OF U.S. INDUSTRY TOTAL	NUMBER	PERCENT OF U.S. TOTAL
All industries	2,434,607	100.0%	18.2%	13,385,470	100.0%
Agriculture	26,750	1.1%	4.1%	654,830	4.9%
Extraction	1,290	0.1%	3.9%	32,770	0.2%
Construction	417,540	17.2%	17.1%	2,439,020	18.2%
Manufacturing	78,640	3.2%	15.4%	509,810	3.8%
Wholesale trade	79,560	3.3%	20.3%	391,330	2.9%
Retail trade	263,250	10.8%	22.6%	1,116,500	8.7%
Transportation	143,110	5.9%	27.1%	528,530	3.9%
Information	19,880	0.8%	11.1%	179,440	1.3%
Finance	133,500	5.5%	11.4%	1,166,170	8.7%
Professional services	406,970	16.7%	15.5%	2,620,140	19.6%
Educational services	24,580	1.0%	14.1%	176,350	1.3%
Health Care and Social Assistance	237,580	9.8%	20.0%	1,190,410	8.9%
Accommodation, Recreation, and Entertainment	207,670	8.5%	25.4%	816,960	6.1%
Other services	394,017	16.2%	26.0%	1,513,200	11.3%

Notes: The sample includes all business owners with 15 or more hours worked per usual week. All reported estimates use sample weights provided by the ACS.

OPEN FOR BUSINESS

31

TOTAL NET BUSINESS INCOME OF IMMIGRANT BUSINESS OWNERS BY INDUSTRY

AMERICAN COMMUNITY SURVEY (2006-2010)

INDUSTRY	IMMIGRANT BUSINESS OWNERS			ALL BUSINESS OWNERS	
	TOTAL BUSINESS INCOME (THOUSANDS)	PERCENT OF IMMIGRANT TOTAL	PERCENT OF U.S. INDUSTRY TOTAL	TOTAL BUSINESS INCOME	PERCENT OF U.S. TOTAL
All industries	\$121,192,740	100.0%	15.0%	807,756,996	100.0%
Agriculture	\$1,140,354	0.9%	3.7%	30,928,391	3.8%
Extraction	\$119,190	0.1%	3.7%	3,254,884	0.4%
Construction	\$16,326,888	13.5%	13.6%	118,107,884	0.4%
Manufacturing	\$4,995,256	4.1%	14.8%	33,669,541	14.6%
Wholesale trade	\$5,181,506	4.3%	17.0%	30,426,138	3.8%
Retail trade	\$11,369,322	9.4%	20.1%	56,548,071	7.0%
Transportation	\$6,650,261	5.5%	22.2%	29,992,721	3.7%
Information	\$1,170,723	1.0%	10.9%	10,723,739	1.3%
Finance	\$9,615,241	7.9%	9.9%	96,716,145	12.0%
Professional services	\$22,043,620	18.2%	11.2%	196,518,675	24.3%
Educational services	\$928,106	0.8%	13.2%	7,043,089	0.9%
Health Care and Social Assistance	\$22,613,813	1.7%	20.2%	111,712,047	13.8%
Accommodation, Recreation, and Entertainment	\$9,329,834	7.7%	24.6%	37,941,267	4.7%
Other services	\$9,708,628	8.0%	22.0%	44,144,676	5.5%

Notes: The sample includes all business owners with 15 or more hours worked per usual week. All reported estimates use sample weights provided by the ACS. Income estimates are reported in 2010 dollars.

NUMBER OF IMMIGRANT BUSINESS OWNERS BY STATE

AMERICAN COMMUNITY SURVEY (2006-2010)

NEW IMMIGRANT BUSINESS OWNERS						ALL BUSINESS OWNERS					
NEW IMMIGRANT BUSINESS OWNERS						ALL BUSINESS OWNERS					
INDUSTRY	NUMBER	PERCENT OF IMMIGRANT TOTAL	PERCENT OF STATE TOTAL	NUMBER	PERCENT OF U.S. TOTAL	INDUSTRY	NUMBER	PERCENT OF IMMIGRANT TOTAL	PERCENT OF STATE TOTAL	NUMBER	PERCENT OF U.S. TOTAL
U.S. Total	2,434,607	100.0%	18.2%	13,385,470	100.0%	Missouri	11,414	0.5%	4.6%	248,920	1.9%
Alabama	7,968	0.3	4.6	172,830	1.3	Montana	1,061	0.0%	1.5%	69,350	0.5%
Alaska	3,394	0.1%	10.1%	33,720	0.3%	Nebraska	3,905	0.2%	3.9%	99,770	0.7%
Arizona	50,706	2.1%	19.6%	259,040	1.9%	Nevada	20,000	0.8%	20.7%	96,740	0.7%
Arkansas	6,171	0.3%	5.0%	122,640	0.9%	New Hampshire	4,253	0.2%	5.7%	74,550	0.6%
California	676,537	27.8%	36.6%	1,850,810	13.8%	New Jersey	101,251	4.2%	28.6%	354,110	2.6%
Colorado	27,645	1.1%	9.7%	283,680	2.1%	New Mexico	11,440	0.5%	12.6%	90,500	0.7%
Connecticut	31,320	1.3%	18.5%	169,730	1.3%	New York	261,140	10.7%	31.2%	835,900	6.2%
Delaware	3,320	0.1%	10.5%	31,590	0.2%	North Carolina	33,120	1.4%	8.4%	394,800	2.9%
D.C.	4,003	0.2%	19.2%	20,850	0.2%	North Dakota	381	0.0%	1.0%	39,830	0.3%
Florida	286,144	11.8%	29.7%	962,050	7.2%	Ohio	20,768	0.9%	5.1%	407,610	3.0%
Georgia	63,342	2.6%	15.5%	409,390	3.1%	Oklahoma	11,983	0.5%	6.9%	174,320	1.3%
Hawaii	15,997	0.7%	23.2%	68,940	0.5%	Oregon	22,216	0.9%	10.7%	207,590	1.6%
Idaho	4,051	0.2%	4.9%	82,060	0.6%	Pennsylvania	38,799	1.6%	8.2%	470,980	3.5%
Illinois	99,810	4.1%	20.3%	491,410	3.7%	Rhode Island	6,478	0.3%	14.4%	44,890	0.3%
Indiana	11,995	0.5%	5.2%	230,190	1.7%	South Carolina	11,869	0.5%	6.7%	176,990	1.3%
Iowa	4,823	0.2%	3.1%	155,110	1.2%	South Dakota	606	0.0%	1.2%	50,760	0.4%
Kansas	7,378	0.3%	5.7%	129,940	1.0%	Tennessee	15,369	0.6%	5.8%	264,480	2.0%
Kentucky	6,143	0.3%	3.8%	162,000	1.2%	Texas	256,849	10.5%	24.9%	1,032,100	7.7%
Louisiana	14,726	0.6%	8.2%	179,790	1.3%	Utah	9,229	0.4%	8.5%	108,450	0.8%
Maine	2,711	0.1%	3.2%	85,040	0.6%	Vermont	1,700	0.1%	3.7%	45,730	0.3%
Maryland	50,028	2.1%	21.2%	236,050	1.8%	Virginia	53,709	2.2%	17.5%	306,640	2.3%
Massachusetts	50,778	2.1%	17.5%	290,360	2.2%	Washington	45,696	1.9%	15.0%	304,930	2.3%
Michigan	30,223	1.2%	8.3%	365,190	2.7%	West Virginia	1,486	0.1%	2.7%	54,270	0.4%
Minnesota	15,001	0.6%	5.7%	261,030	2.0%	Wisconsin	10,342	0.4%	4.3%	239,610	1.8%
Mississippi	4,534	0.2%	4.2%	107,020	0.8%	Wyoming	809	0.0%	2.6%	31,180	0.2%

Notes: The sample includes all business owners with 15 or more hours worked per usual week. All reported estimates use sample weights provided by the ACS.

TOTAL NET BUSINESS INCOME OF IMMIGRANT BUSINESS OWNERS BY STATE
 AMERICAN COMMUNITY SURVEY (2006-2010)

NEW IMMIGRANT BUSINESS OWNERS						ALL BUSINESS OWNERS					
INDUSTRY	TOTAL BUSINESS INCOME (THOUSANDS)	PERCENT OF IMMIGRANT TOTAL	PERCENT OF STATE TOTAL	TOTAL BUSINESS INCOME (THOUSANDS)	PERCENT OF U.S. TOTAL	INDUSTRY	TOTAL BUSINESS INCOME (THOUSANDS)	PERCENT OF IMMIGRANT TOTAL	PERCENT OF STATE TOTAL	TOTAL BUSINESS INCOME (THOUSANDS)	PERCENT OF U.S. TOTAL
U.S. Total	\$121,192,740	100.0%	15.0%	\$807,756,99	100.0%	Missouri	\$650,043	0.5%	5.0%	\$12,944,268	1.6%
Alabama	\$337,298	0.3%	3.4%	\$9,848,572	1.2%	Montana	\$44,083	0.0%	1.4%	\$3,148,001	0.4%
Alaska	\$160,452	0.1%	7.8%	\$2,066,323	0.3%	Nebraska	\$126,155	0.1%	2.7%	\$4,726,479	0.6%
Arizona	\$2,185,123	1.8%	14.2%	\$15,395,685	1.9%	Nevada	\$1,134,154	0.9%	18.8%	\$6,737,466	0.8%
Arkansas	\$286,727	0.2%	4.7%	\$6,064,221	0.8%	New Hampshire	\$252,282	0.2%	5.8%	\$4,344,390	0.5%
California	\$34,310,456	28.3%	28.1%	\$121,889,173	15.1%	New Jersey	\$6,220,997	5.1%	22.4%	\$27,772,582	3.4%
Colorado	\$1,221,867	1.0%	7.3%	\$16,681,092	2.1%	New Mexico	\$388,780	0.3%	8.9%	\$4,361,555	0.5%
Connecticut	\$2,051,211	1.7%	15.0%	\$13,670,931	1.7%	New York	\$12,637,581	10.4%	22.6%	\$55,963,281	6.9%
Delaware	\$261,258	0.2%	12.6%	\$2,074,398	0.3%	North Carolina	\$1,665,318	1.4%	7.7%	\$21,532,068	2.7%
D.C.	\$242,333	0.2%	10.8%	\$2,243,227	0.3%	North Dakota	\$20,648	0.0%	1.0%	\$2,119,841	0.3%
Florida	\$13,299,475	11.0%	23.8%	\$55,946,379	6.9%	Ohio	\$1,278,864	1.1%	5.7%	\$22,383,638	2.8%
Georgia	\$2,920,530	2.4%	12.3%	\$23,662,673	2.9%	Oklahoma	\$476,515	0.4%	5.3%	\$8,911,407	1.1%
Hawaii	\$771,663	0.6%	19.8%	\$3,902,680	0.5%	Oregon	\$1,079,448	0.9%	9.8%	\$11,019,656	1.4%
Idaho	\$191,547	0.2%	4.7%	\$4,098,994	0.5%	Pennsylvania	\$2,175,029	1.8%	7.6%	\$28,738,393	3.6%
Illinois	\$5,404,305	4.5%	16.5%	\$32,800,599	4.1%	Rhode Island	\$360,125	0.3%	13.0%	\$2,769,586	0.3%
Indiana	\$721,603	0.6%	5.6%	\$12,935,951	1.6%	South Carolina	\$521,896	0.4%	5.3%	\$9,792,601	1.2%
Iowa	\$215,793	0.2%	2.8%	\$7,637,181	0.9%	South Dakota	\$13,137	0.0%	0.5%	\$2,625,394	0.3%
Kansas	\$351,433	0.3%	5.0%	\$7,037,337	0.9%	Tennessee	\$850,604	0.7%	5.6%	\$15,094,881	1.9%
Kentucky	\$450,916	0.4%	5.4%	\$8,399,602	1.0%	Texas	\$10,038,746	8.3%	18.7%	\$60,102,102	7.4%
Louisiana	\$690,922	0.6%	6.7%	\$10,336,436	1.3%	Utah	\$387,788	0.3%	6.1%	\$6,353,397	0.8%
Maine	\$119,688	0.1%	3.3%	\$3,680,696	0.5%	Vermont	\$84,000	0.1%	3.8%	\$2,201,572	0.3%
Maryland	\$2,750,312	2.3%	16.3%	\$16,843,132	2.1%	Virginia	\$3,022,260	2.5%	14.9%	\$20,255,140	2.5%
Massachusetts	\$2,818,756	2.3%	14.0%	\$20,174,706	2.5%	Washington	\$2,415,906	2.0%	13.1%	\$18,436,686	2.3%
Michigan	\$1,844,369	1.5%	9.2%	\$20,033,611	2.5%	West Virginia	\$138,755	0.1%	5.1%	\$2,719,038	0.3%
Minnesota	\$771,888	0.6%	5.1%	\$14,996,055	1.9%	Wisconsin	\$589,060	0.5%	4.6%	\$12,756,994	1.6%
Mississippi	\$181,050	0.1%	3.2%	\$5,722,364	0.7%	Wyoming	\$59,612	0.0%	3.3%	\$1,804,562	0.2%

Notes: The sample includes all business owners with 15 or more hours worked per usual week. All reported estimates use sample weights provided by the ACS.

References

Borjas, G. 1986. The self-employment experience of immigrants. *Journal of Human Resources*, 21, Fall: 487-506.

Bradford, William D. 2003. "The Wealth Dynamics of Entrepreneurship for Black and White Families in the U.S.," *Review of Income and Wealth*, 49(1): 89-116.

Bucks, Brian K., Arthur B. Kennickell, and Kevin B. Moore. 2006. "Recent Changes in U.S. Family Finances: Evidence from the 2001 and 2004 Survey of Consumer Finances," *Federal Reserve Bulletin*, Washington, D.C.: Board of Governors of the Federal Reserve System.

Clark, Kenneth and Stephen Drinkwater. 2000. "Pushed out or pulled in? Self-employment among ethnic minorities in England and Wales." *Labour Economics*. 7, pp.603-628.

Clark, Kenneth and Stephen Drinkwater. 2006. "Changing Patterns of Ethnic Minority Self-Employment in Britain: Evidence from Census Microdata," IZA Discussion Papers 2495, Bonn, Germany: Institute for the Study of Labor (IZA).

Fairlie, Robert W. 2006. "Entrepreneurship among Disadvantaged Groups: An Analysis of the Dynamics of Self-Employment by Gender, Race and Education," *Handbook of Entrepreneurship*, Volume 2, eds. Simon C. Parker, Zoltan J. Acs, and David R. Audretsch, Kluwer Academic Publishers, 437-478.

Fairlie, Robert W. 2008. *Estimating the Contribution of Immigrant Business Owners to the U.S. Economy*, U.S. Small Business Administration, Office of Advocacy, Washington, D.C.

Fairlie, Robert W. and Alicia M. Robb. 2008. *Race and entrepreneurial success: Black-, Asian-, and White-owned businesses in the United States*. Cambridge, MA: MIT Press.

Fairlie Robert W., Julie Zissimopoulos, and Harry A. Krashinsky. 2010. The international Asian business success story: A comparison of Chinese, Indian, and other Asian businesses in the United States, Canada, and United Kingdom. *International differences in entrepreneurship*, in Josh Lerner and Antoinette Shoar, eds. University of Chicago Press and National Bureau of Economic Research, 179-208.

Haltiwanger, John, Ron S Jarmin, and Javier Miranda. 2011. "Who Creates Jobs? Small vs. Large vs. Young," University of Maryland Working Paper.

Headd, B., and R. Saade. 2008. *Do business definition decisions distort small business results?* Washington, D.C. : U.S. Small Business Administration, Office of Advocacy working paper.

Herander, Mark G., and Luz A. Saavedra. 2005. "Exports and the Structure of Immigrant-Based Networks: The Role of Geographic Proximity," 87(2): 323-335.

- Hunt, Jennifer, and Marjolaine Gauthier-Loiselle. 2010. "How much does immigration boost innovation?" *American Economic Journal: Macroeconomics*, 2(2): 31–56.
- Kerr, William R., and William F. Lincoln. 2010. "The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention", *Journal of Labor Economics*, 28(3): 473-508.
- Lofstrom, Magnus. 2002. "Labor market assimilation and the self-employment decision of immigrant entrepreneurs", *Journal of Population Economics*, 15(1), January, 83-114.
- OECD (2005). *SME and Entrepreneurship Outlook – 2005 Edition*, Organisation for Economic Co-operation and Development Press.
- Partnership for a New American Economy and the Partnership for New York City. 2012. Not Coming to America: Why the U.S. is Falling Behind in the Global Race for Talent.
- Reynolds, Paul. 2005. *Entrepreneurship in the US: The Future is Now*. Springer.
- Saxenian, A. 1999. *Silicon Valley's new immigrant entrepreneurs*, San Francisco: Public Policy Institute of California.
- Saxenian, A. 2000. Networks of immigrant entrepreneurs. In *The Silicon Valley edge: A habitat for innovation and entrepreneurship*. C. Lee, W. F. Miller, and H. S. Rowen, eds. Stanford: Stanford University Press.
- Schuetze, H. J., and H. Antecol. 2007. Immigration, entrepreneurship and the venture start-up process. *The life cycle of entrepreneurial ventures: International handbook series on entrepreneurship, vol. 3*, S. Parker, ed. Springer: New York.
- Singer, Audrey. 2012. *Immigrant Workers in the U.S. Labor Force*, Brookings Institute and Partnership for a New American Economy Report.
- U.S. Department of Homeland Security. 2011. *2010 yearbook of immigration statistics*, Washington, D.C.: Office of Immigration Statistics, http://www.dhs.gov/xlibrary/assets/statistics/yearbook/2010/ois_yb_2010.pdf.
- U.S. Department of Homeland Security. 2012. *EB-5 Immigrant Investor*, <http://www.uscis.gov>.
- U.S. Small Business Administration, Office of Advocacy. 2011. *Research and Statistics*, <http://www.sba.gov/advocacy/847>.
- Wadhwa, V. A. Saxenian, B. Rissing, and G. Gereff. 2007. *America's new immigrant entrepreneurs*. Durham, NC: Duke University.

End Notes

- 1 Tim Kane, Ewing Marion Kauffman Foundation, *The Importance of Startups in Job Creation and Job Destruction* (2010), http://www.kauffman.org/uploadedfiles/firm_formation_importance_of_startups.pdf.
- 2 Press Release, Ewing Marion Kaufman Foundation, *Number of New Firms Continues to Slide, According to New Census Bureau Data* (May 2, 2012), <http://www.kauffman.org/newsroom/number-of-firms-continues-to-slide-according-to-new-census-bureau-data.aspx>.
- 3 All individual stories in this report come from interviews conducted by Angela Marek Zeitlin and Hanna Siegel of the Partnership for a New American Economy, June-August, 2012.
- 4 See *infra*, section 6.
- 5 Fiscal Policy Institute, *Immigrant Small Business Owners: A Significant and Growing Part of the American Economy* (2012), <http://fiscalpolicy.org/wp-content/uploads/2012/06/immigrant-small-business-owners-FPI-20120614.pdf>. Research has shown that immigrants in many developed countries around the world, including the United States, United Kingdom, Canada, and Australia, have higher business ownership rates than their native-born counterparts. See: G.J. Borjas, *The Self-Employment Experience of Immigrants*, *Journal of Human Resources*, 21, Fall: 487-506 (1986); Magnus Lofstrom, *Labor Market Assimilation and the Self-Employment Decision of Immigrant Entrepreneurs*, *Journal of Population Economics*, 15(1), January: 83-114 (2002); Kenneth Clark and Stephen Drinkwater, *Pushed Out or Pulled In? Self-Employment among Ethnic Minorities in England and Wales*, *Labour Economics*, 7: 603-628 (2000); Clark and Drinkwater, *Changing Patterns of Ethnic Minority Self-Employment in Britain: Evidence from Census Microdata*, IZA Discussion Papers 2495, Institute for the Study of Labor (2006); H. J. Schuetze and H. Antecol, *Immigration, Entrepreneurship and the Venture Start-Up Process, The Life Cycle of Entrepreneurial Ventures: International Handbook Series on Entrepreneurship*, Vol. 3 (2007); Robert W. Fairlie, et al., *The International Asian Business Success Story: A Comparison of Chinese, Indian, and Other Asian Businesses in the United States, Canada, and United Kingdom, International Differences in Entrepreneurship*, University of Chicago Press and National Bureau of Economic Research: 179-208 (2010). Their impact has been especially well documented in certain sectors such as technology and engineering, where they play a disproportionately large role in founding companies and inventing the products that lead to companies. Immigrants found 50 percent of Silicon Valley companies and are behind more than three out of every four patents from the top U.S. universities. See: Vivek Wadhwa, et al., *America's New Immigrant Entrepreneurs* (2007), http://people.ischool.berkeley.edu/~anno/Papers/Americas_new_immigrant_entrepreneurs_L.pdf; A. Saxenian, *Silicon Valley's New Immigrant Entrepreneurs*, Public Policy Institute of California (1999); Saxenian, *Networks of Immigrant Entrepreneurs, The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship*, Stanford University Press (2000); Partnership for a New American Economy and the Partnership for New York City, *Not Coming to America: Why the U.S. is Falling Behind in the Global Race for Talent* (2012), <http://www.renewoureconomy.org/sites/all/themes/pnae/not-coming-to-america.pdf>. This impact of immigrants on innovation has even been found to have positive spillover effects in increasing the patenting rate of the native-born as well. See: Jennifer Hunt and Marjolaine Gauthier-Loiselle, *How much Does Immigration Boost Innovation?* *American Economic Journal: Macroeconomics*, 2(2): 31-56 (2010); William R. Kerr and William F. Lincoln, *The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention*, *Journal of Labor Economics*, 28(3): 473-508 (2010). In recognition of the positive benefits of immigrant entrepreneurship, many developed countries have created special visas and entry requirements for immigrant entrepreneurs. See: Schuetze and Antecol (2006); Partnership for a New American Economy (2012).
- 6 The ACS is the only nationally representative dataset with a large enough sample size to examine business ownership among immigrant groups, and the SBO is the only business-level dataset with information on a large sample of immigrants. Matching consecutive months of CPS data creates the only longitudinal data source, which is needed to study business formation, with large enough immigrant samples. The full methodology is explained in greater detail in Appendix A. The results presented here build on an earlier related study using the 2000 Census 5 percent PUMS, 1996-2007 CPS and 1992 Characteristics of Business Owners. See: Robert W. Fairlie, U.S. Small Business Administration, Office of Advocacy, *Estimating the Contribution of Immigrant Business Owners to the U.S. Economy* (2008).
- 7 Tim Kane, Ewing Marion Kauffman Foundation, *The Importance of Startups in Job Creation and Job Destruction* (2010), http://www.kauffman.org/uploadedfiles/firm_formation_importance_of_startups.pdf.
- 8 Press Release, White House, *President Obama To Sign Jumpstart Our Business Startups (JOBS) Act* (April 5, 2012), <http://www.whitehouse.gov/the-press-office/2012/04/05/president-obama-sign-jumpstart-our-business-startups-jobs-act>. Another recent example is the "STARTUP 2.0" bill introduced by Democratic Senators Mark Warner and Chris Coons and Republican Senators Jerry Moran and Marco Rubio in May of 2012 that would create a visa for foreign entrepreneurs, provide tax credits for research and development at young startups, and make permanent a capital gains exemption to help draw investment to new startups. See: Press Release, Senator Marco Rubio, Sens. Rubio, Coons, Moran, and Warner, *Offer Bipartisan Job Creation Plan* (May 22, 2012), <http://www.rubio.senate.gov/public/index.cfm/press-releases?ID=d8319a4a-b008-4b7e-9814-1c0339c78bd5>.
- 9 John Haltiwanger, Ron Jarmin, and Javier Miranda, Ewing Marion Kauffman Foundation, *Where Have All the Young Firms Gone?* (May 2012), http://www.census.gov/ces/pdf/BDS_StatBrief6_Young_Firms.pdf.
- 10 The American Community Survey, which provides annual data on immigrant share of the population, was not fully implemented until 2005. For prior years, data was only available from the decennial censuses. According to the census, immigrants accounted for 7.9 percent of the population in 1990 and 11.1 percent in 2000.
- 11 Telephone Interview with Rohit Arora (Jul 12, 2012).
- 12 The World Bank, *World Development Indicators*, <http://data.worldbank.org/country/united-states> (last accessed Aug 8, 2012).
- 13 *Id.*
- 14 *Made in America: Increasing Jobs through Exports and Trade*, Testimony of Daniel J. Ikenson of the Cato Institute to the Subcommittee on Commerce, Manufacturing, and Trade (Mar 16, 2011), <http://www.cato.org/publications/congressional-testimony/made-america-increasing-jobs-through-exports-trade>.
- 15 *Id.*
- 16 U.S. Department of Commerce, International Trade Administration, *Exports Play a Vital Role in Supporting U.S. Employment* (May 2010), http://trade.gov/publications/ita-newsletter/0510/itu_0510.pdf.
- 17 Tyler Cowen, *What Export-Oriented America Means*, *The American Interest* (May/June 2012), <http://www.the-american-interest.com/article.cfm?piece=1227>.
- 18 United States Department of Labor, Bureau of Labor Statistics, *U.S. Import and Export Price Indexes* (June 2012), <http://www.bls.gov/news.release/ximpim.nr0.htm> (last accessed Aug 8, 2012).
- 19 Giovanni Peri and Francisco Requena-Silvente, *Do Immigrants Create Exports? Evidence From Spain*, *Vox* (Jan 26, 2010), <http://www.voxeu.org/article/do-immigrants-create-exports-new-evidence-spain>.
- 20 Mark G. Herander and Luz A. Saavedra, *Exports and the Structure of Immigrant-Based Networks: The Role of Geographic Proximity*, *The Review of Economics and Statistics*, 87(2): 323-335 (2005).
- 21 The data used to calculate exports come from the 2007 Survey of Business Owners which, for the first time, included information on both owner's immigrant status and exports. Tabulations of export levels for immigrant and non-immigrant businesses from the 2007 SBO were commissioned specifically for the research in this report. Similar to sales, employment and payroll these data are not available for immigrant businesses in published reports by the Census Bureau. The reported percentages represent the share of total sales of goods and services represented by exports outside of the United States.
- 22 Tyler Cowen, *What Export-Oriented America Means*, *The American Interest* (May/June 2012), <http://www.the-american-interest.com/article.cfm?piece=1227>.
- 23 Telephone Interview with Metta Murdaya (Jul 24, 2012).
- 24 United States Department of Commerce, Bureau of Economic Analysis, *National Data: Gross Domestic Product*, <http://www.bea.gov/national/index.htm#gdp> (last accessed Aug 8, 2012).
- 25 *Id.*
- 26 Congressional Budget Office, *Federal Budget Deficit for Fiscal Year 2011: \$1.3 Trillion* (Nov 8, 2011), <http://www.cbo.gov/publication/42573>; Congressional Budget Office, *Recap of Fiscal Year 2010 Budget Results* (Nov 5, 2010) <http://www.cbo.gov/publication/25114>; Congressional Budget Office, *Federal Budget Deficit Totals \$1.4 Trillion in Fiscal Year 2009* (Nov 6, 2009), <http://www.cbo.gov/publication/24992>.
- 27 *Recession Cost Uncle Sam \$4.2 Trillion*, *Wall Street Journal*, April 21, 2011, http://articles.marketwatch.com/2011-04-21/commentary/30746730_1_stimulus-spending-tax-cuts-unemployment-benefits.
- 28 This number actually undersells the revenue generated by immigrant-owned firms because it does not include any revenue from the 12.5 million firms in American where the founder's status—immigrant or otherwise—is indeterminate, a group of companies that generate more than \$3 trillion in sales annually.
- 29 The income generated by immigrant-owned businesses is measured by using the American Community Survey to examine the contribution of immigrant business owners to total business income generated by all U.S. business owners. This measure captures the owner's income from the business and does not capture what is paid to employees (which was examined later). The revenue generated by immigrant-owned businesses is measured by examining the total sales and receipts by immigrant-owned businesses. As noted above, however, published estimates from the SBO do not report sales for immigrant business owners. Instead, estimates from specially commissioned tabulations from the SBO are reported. The SBO is the only large nationally representative business-level dataset that provides information on immigrant status. Total sales information in the SBO is based on administrative data collected by the Census Bureau from tax reporting. Total sales data do not subtract out total expenses or payroll expenses, and thus do not represent profits of the business. Total sales represent a gross measure and not a net measure of the productivity of the firm. But, total sales do capture the total gross flow of revenues to the business, and thus represent a good measure of business contributions to the economy. As noted above, following the convention used by the Census Bureau in reporting business statistics by race, immigrant-owned businesses are defined as those with majority foreign-born ownership (51% or more) and non-immigrant businesses are defined as those with majority U.S.-born ownership (51% or more).

OPEN FOR BUSINESS

- 30 The data on revenue from immigrant-owned businesses is not available from 2000, so the analysis of changes in business revenue over time cannot be made.
- 31 U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index, <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiat.txt> (last accessed Aug 8, 2012).
- 32 As estimated in the 2000 Census 5 Percent PUMS data. See: Fairlie (2008).
- 33 Mortimer B. Zuckerman, The Great Jobs Recession Goes On, U.S. News and World Report, Feb 11, 2011, <http://www.usnews.com/opinion/mzuckerman/articles/2011/02/11/the-great-jobs-recession-goes-on>.
- 34 United States Department of Labor, Bureau of Labor Statistics, The Recession of 2007-2009 (Feb 2012), <http://www.bls.gov/spotlight/2012/recession/>
- 35 Id.
- 36 Press Release, U.S. Department of Labor, Bureau of Labor Statistics, The Employment Situation—2012 (Aug 3, 2012), <http://www.bls.gov/news.release/pdf/empst.pdf>.
- 37 Estimates of employment for immigrant-owned businesses are derived from specially-commissioned tabulations of the Survey of Business Owners, which is the only dataset with employment information for a large nationally representative sample of immigrant-owned businesses.
- 38 "Privately-owned companies" excludes the government, nonprofits, public companies, which have no one person or group of people that can be called the "owner," and any other company where the owner is not identifiable.
- 39 Telephone Interview with Sergio Bermudez (Jul 24, 2012).
- 40 For example, research by Vivek Wadhwa has found that immigrants founded more than 25 percent of technology companies nationwide, and more than 50 percent of such companies in Silicon Valley. See: Wadhwa et al. (2007).
- 41 Press Release, U.S. Department of Labor, Bureau of Labor Statistics, Employment Projections—2010-20 (Feb 1, 2012), <http://www.bls.gov/news.release/pdf/ecopro.pdf>.
- 42 The CPS data from which the immigrant share of new companies is derived only exists for the category of "education and health services" and is not broken up precisely into "health care and social assistance" and "educational services," which BLS lists as two separate categories.
- 43 The CPS data from which the immigrant share of new companies is derived gives data from "wholesale and retail trade," and not specifically for "retail trade."
- 44 The CPS data from which the immigrant share of new companies is derived only exists for the category of "education and health services" and is not broken up precisely into "health care and social assistance" and "educational services," which BLS lists as two separate categories.
- 45 The Bureau of Labor Statistics uses the industry sector of "Other Services" to "comprise[] establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and providing drycleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services." See: U.S. Department of Labor, Bureau of Labor Statistics, Description of Other Services (except Public Administration): NAICS 81, <http://www.bls.gov/iag/tgs/iag81.htm> (last accessed Aug 10, 2012).
- 46 The lack of available data has made it very difficult to conclusively analyze the failure rates of immigrant and native-owned businesses, and there are no conclusive studies on the subject. Some anecdotal evidence has suggested that immigrant startups fail at a slightly higher rate than those of the native-born. Conversely, a few studies have shown that some specific immigrant groups have lower failure rates than their native-born counterparts, such as Korean and Chinese retail storeowners, who were found to have failure rates more than 40 percent lower than both native-born white and African-American retail storeowners. See: Timothy Bates, Race, Self-Employment and Upward Mobility, Woodrow Wilson Center Press: 215 (1997). Evidence from other countries is equally inconclusive, but does seem to suggest that immigrants are in fact slightly less likely to have their startups succeed. In France, for example, researchers found that immigrant-owned startups failed at higher rates during growth periods (54 percent of native-owned startups were still in existence after three years, compared with 40 percent for immigrant-owned startups), but that in periods of slow economic growth the failure rates of the two groups were equivalent. See: Maria Vincenza Desiderio and John Salt, Main Findings of the Conference on Entrepreneurship and Employment Creation of Immigrants in OECD Countries, Organisation for Economic Co-operation and Development, Paris (June 9-10, 2010), <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CFsQFjAC&url=http%3A%2F%2Fwww.oecd.org%2Fmigration%2F46424942.doc&ei=M5jUJqIN6X40gHJ24DgDw&usq=AFQjCNE5obqCJmU1T2osBNkRQFSGKLQgww>.
- 47 Immigrants already own more than one-quarter of all businesses in the transportation and more than 20 percent of all businesses in retail trade, wholesale trade, and health care and social assistance.
- 48 Telephone Interview with Tashitaa Tufaa (Jul 16, 2012).
- 49 The immigrant population numbers come from an analysis of the 2010 census conducted by the Migration Policy Institute. See: Migration Policy Institute, 2010 American Community Survey and Census Data on the Foreign Born by State, <http://www.migrationinformation.org/datahub/acscensus.cfm> (last accessed Aug 10, 2012).
- 50 This is consistent with previous findings on the importance of immigrants in California and the Silicon Valley. See: Saxenian (1999 & 2000); and Wadhwa et al. (2006).
- 51 See discussion of failure rates in footnote 46.
- 52 Alex Goldmark, Terracycle to Turn Dirty Diapers Into Park Benches, Fast Company, August 27, 2011, <http://www.fastcoexist.com/1679425/terracycle-to-turn-dirty-diapers-into-park-benches>.
- 53 Telephone Interview with Tom Szaky (Mar 30, 2012).
- 54 Estimates of immigrant-owned business starts are reported only for the 10 largest immigrant groups because sample sizes are not large enough. Although the number of non-business owners is large for each source country, the number of new business owners per month recorded in the data is relatively small (0.28 percent).
- 55 According to past research by the Brookings Institution and the Partnership for a New American Economy, Roughly 29 percent of immigrants lack a high school diploma compared with just 7.4 percent of the native-born. See: Brookings Institution & Partnership for a New American Economy, Slideshow: Immigrant Workers in the U.S. Labor Force (Mar 2012), http://www.renewoureconomy.org/brook_slideshow#3.
- 56 Unemployment in the U.S. tends to track educational attainment. In 2011, high school dropouts had an unemployment rate of 14.1 percent. The unemployment rate dropped to 9.4 percent for those with a high school degree, 4.9 percent for those with a college degree, 3.6 percent for those with a masters, and 2.5 percent for those with a PhD. New businesses in communities where many or most residents lack a high school diploma should therefore be a key priority of our economic recovery. And, to the extent that people in the United States tend to live in communities with people of similar educational attainment, the data suggest that immigrants are disproportionately poised to start new businesses among communities with the highest unemployment. See: U.S. Department of Labor, Bureau of Labor Statistics, Employment Projections (Mar 23, 2012), http://www.bls.gov/emp/ep_chart_001.htm/ (last accessed Aug 8, 2012).
- 57 See: U.S. Chamber of Commerce, Immigrant Entrepreneurs: Creating Jobs and Strengthening the Economy, www.uschamber.com/sites/default/files/reports/Immigrant%20Entrepreneur%20final%201-22-2012.pdf; Wall Street Journal, Migrants Keep Small-Business Faith, (Jun 13, 2012), <http://online.wsj.com/article/SB10001424052702303410404577464853249366254.html>; and Immigrant Learning Center, Immigrant Entrepreneurs and Neighborhood Revitalization, http://www.ilctr.org/wp-content/uploads/2009/09/immigrant_entrepreneur.pdf.
- 58 Telephone Interview with Shukri Ali (Jul 15, 2012).
- 59 Telephone Interview with Ismail Ahmed (Jul 11, 2012).
- 60 Some unemployed individuals may report being self-employed if they sell a small quantity of goods or services while not working at their regular jobs.
- 61 For more discussion on the comparison between individual-level and business-level data on entrepreneurship, see: B. Headd and R. Saade, Do Business Definition Decisions Distort Small Business Results? U.S. Small Business Administration, Office of Advocacy working paper (2008); and Robert W. Fairlie and Alicia M. Robb, Race and Entrepreneurial Success: Black-, Asian-, and White-Owned Businesses in the United States, MIT Press, (2008).
- 62 Published data from the Census Bureau also only report foreign-born owners and not businesses (which is why no sales, employment, payroll and export information is reported). Nonetheless, research by Robert W. Fairlie finds that published estimates for the SBO report show a very similar ratio of foreign-born owners to foreign-born and U.S. born owners.

© 2012. ALL RIGHTS RESERVED

WWW.RENEWOURECONOMY.ORG

EXHIBIT 4

Results from Tom K. Wong¹ et al., 2017 National DACA Study

Updated 10/7 to include urban-rural cross-tabulations

Survey fielded 8/1/2017 to 8/20/2017

n = 3,063

Methodology	1
Economic Integration	2-5
Education	6-7
Inclusion and Belonging	8-9

¹ Tom K. Wong is associate professor of political science at the University of California, San Diego.
tomkwong@ucsd.edu

Methodology

The questionnaire was administered to an online panel of DACA recipients recruited by the partner organizations. Several steps were taken to account for the known sources of bias that result from such online panels. To prevent ballot stuffing—one person submitting multiple responses—the authors did not offer an incentive to respondents for taking the questionnaire and used a state-of-the-art online survey platform that does not allow one IP address to submit multiple responses. To prevent spoiled ballots—meaning people responding who are not undocumented—the authors used a unique validation test for undocumented status. Multiple questions were asked about each respondent's migratory history. These questions were asked at different parts of the questionnaire. When repeated, the questions were posed using different wording. If there was agreement in the answers such that there was consistency regarding the respondent's migratory history, the respondent was kept in the resulting pool of respondents. If not, the respondent was excluded. In order to recruit respondents outside of the networks of the partner organizations, Facebook ads were also used. Because there is no phone book of undocumented immigrants, and given the nature of online opt-in surveys, it is not possible to construct a valid margin of error.

Economic Integration

Check all that apply. After my DACA application was approved, I...

(*n* = 3,063)

		≥ 25		Urban	Rural
Got my first job	54.2%	35.3%		53.6%	63.8%
Got a job with better pay	68.5%	77.7%		68.6%	66.1%
Got a job that better fits my education and training	54.2%	59.6%		54.3%	50.3%
Got a job that better fits my long-term career goals	53.9%	61.4%		53.9%	51.4%
Got a job with health insurance or other benefits	57.3%	66.9%		56.9%	61.0%
Got a job with improved work conditions	56.2%	64.4%		56.2%	55.9%
Started my own business	5.4%	7.9%		5.3%	5.1%
I have been able to earn more money, which has helped me become financially independent	69.0%	73.4%		69.1%	66.1%
I have been able to earn more money, which has helped my family financially	70.8%	73.7%		71.0%	69.5%
Opened a bank account	61.0%	47.3%		60.5%	68.9%
Got my first credit card	65.7%	67.9%		66.4%	57.6%
Bought my first car	64.5%	67.2%		64.6%	66.1%
Bought a home	15.7%	23.5%		15.2%	21.5%

Note: percentages do not sum to 100 as individuals may select all that apply. *n* = 1,662 for all respondents 25 years and older. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Are you currently employed?

(*n* = 3,063)

		≥ 25		Urban	Rural
Yes	91.4%	93.3%		91.4%	90.9%
No	8.6%	6.7%		8.6%	9.0%
No response	0.0%	0.0%		0.4%	0.0%

Note: percentages may not sum to 100 due to rounding. *n* = 1,662 for all respondents 25 years and older. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Please indicate your average hourly wage OR annual salary.

($n = 2,800$, which represents the 91.4% of all respondents who are currently employed)

		≥ 25		Urban	Rural
Average hourly wage	\$17.46	\$20.05	|	\$17.67	\$15.11
Median hourly wage	\$15.34	\$17.90		\$15.50	\$14.00
Average annual earnings	\$36,231.91	\$41,621.48		\$36,482.76	\$31,858.84
Median annual earnings	\$32,000.00	\$37,595.03		\$32,000.00	\$29,000.00

Note: $n = 1,551$ for respondents 25 years and older and currently employed. $n = 2,743$ for respondents who are currently employed and for which urban-rural data are available. Figures exclude the bottom 1st and top 99th percentiles.

On average, how many hours do you work per week?

($n = 2,800$, which represents the 91.4% of all respondents who are currently employed)

		≥ 25		Urban	Rural
Average hours worked per week	37.9	39.9	|	37.9	38.8
Median hours worked per week	40.0	40.0		40.0	40.0

Note: $n = 1,551$ for respondents 25 years and older and currently employed. $n = 2,743$ for respondents who are currently employed and for which urban-rural data are available. Figures exclude the bottom 1st and top 99th percentiles.

Were you employed before DACA?

($n = 2,800$, which represents the 91.4% of all respondents who are currently employed)

		≥ 25		Urban	Rural
Yes	43.9%	60.7%	|	44.4%	39.1%
No	55.9%	38.9%		55.7%	60.9%
No response	0.3%	0.4%		0.0%	0.0%

Note: $n = 1,551$ for respondents 25 years and older and currently employed. $n = 2,743$ for respondents who are currently employed and for which urban-rural data are available. Figures exclude the bottom 1st and top 99th percentiles.

..... **Please indicate your average hourly wage OR annual salary before DACA.**
 ($n = 1,229$, which represents the 43.9% of respondents who are currently employed and were also employed before DACA)

		≥ 25	Urban	Rural
Average hourly wage	\$10.29	\$10.87	\$10.37	\$9.29
Median hourly wage	\$9.59	\$10.00	\$9.59	\$9.00
Average annual earnings	\$20,068.49	\$21,950.47	\$19,944.40	\$21,607.65
Median annual earnings	\$19,000.00	\$20,857.16	\$18,990.01	\$19,586.18

Note: $n = 942$ for respondents 25 years and older, currently employed, and were employed before DACA. $n = 1,205$ for respondents who are currently employed, were employed before DACA, and for which urban-rural data are available. Figures exclude the bottom 1st and top 99th percentiles.

..... **On average, how many hours did you work per week before DACA?**
 ($n = 1,229$, which represents the 43.9% of respondents who are currently employed and were also employed before DACA)

		≥ 25	Urban	Rural
Average hours worked per week	37.7	39.2	37.3	42.9
Median hours worked per week	40.0	40.0	40.0	40.0

Note: $n = 942$ for respondents 25 years and older, currently employed, and were employed before DACA. $n = 1,205$ for respondents who are currently employed, were employed before DACA, and for which urban-rural data are available. Figures exclude the bottom 1st and top 99th percentiles.

..... **Does your employer know that you have DACA?**
 ($n = 2,800$, which represents the 91.4% of all respondents who are currently employed)

		Urban	Rural
Yes	50.0%	50.3%	45.9%
No	11.4%	11.5%	8.1%
Not sure	37.7%	37.4%	44.7%
No response	0.9%	1.2%	0.8%

Note: percentages may not sum to 100 due to rounding. $n = 2,743$ for respondents who are currently employed and for which urban-rural data are available.

Are you bilingual?

($n = 2,800$, which represents the 91.4% of all respondents who are currently employed)

			Urban	Rural
Yes	.....	98.1%	98.1%	99.4%
No	.....	1.9%	1.9%	0.0%
No response	.....	0.1%	0.0%	0.6%

Note: percentages may not sum to 100 due to rounding. $n = 2,743$ for respondents who are currently employed and for which urban-rural data are available.

Do you agree or disagree with the following statement: “My being bilingual has been an asset to my employer.”

($n = 2,746$, which represents the 98.1% of respondents who are currently employed and are bilingual)

			Urban	Rural
Strongly agree	.....	80.1%	79.9%	81.3%
Agree	.....	12.5%	12.6%	13.1%
Neither agree nor disagree	.....	6.1%	5.9%	5.6%
Disagree	.....	0.8%	0.8%	0.0%
Strongly disagree	.....	0.4%	0.4%	0.0%
No response	.....	0.2%	0.2%	0.0%
Agree/strongly agree	.....	92.6%	92.6%	94.4%
Neither agree nor disagree	.....	6.1%	5.9%	5.6%
Disagree/strongly disagree	.....	1.2%	1.2%	0.0%
No response	.....	0.2%	0.2%	0.0%

Note: percentages may not sum to 100 due to rounding. $n = 2,693$ for respondents who are currently employed, are bilingual, and for which urban-rural data are available.

Education

Check all that apply. After my DACA application was approved, I...

(*n* = 3,063)

			≥ 25	|	Urban	Rural
Pursued educational opportunities that I previously						
could not	.....	65.3%	54.2%		65.3%	63.3%
I haven't pursued more education yet, but I plan to	.....	33.3%	42.7%		33.4%	36.2%
I don't plan to pursue more education	.....	3.3%	5.1%		3.4%	2.3%
Paid off some/all of my student loans	.....	18.4%	18.3%		18.3%	16.4%

Note: percentages do not sum to 100 as individuals may select all that apply. *n* = 1,662 for all respondents 25 years and older. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Are you currently in school?

(*n* = 3,063)

			≥ 25	|	Urban	Rural
Yes	.....	44.9%	30.6%		45.0%	40.7%
No	.....	55.0%	69.3%		54.9%	58.8%
No response	.....	0.1%	0.1%		0.1%	0.6%

Note: percentages may not sum to 100 due to rounding. *n* = 1,662 for all respondents 25 years and older. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

What degree are you currently pursuing?

(n = 1,374, which represents 44.9% of all respondents who are currently in school)

			≥ 25	Urban	Rural
	GED or equivalent	0.9%	2.2%	0.8%	2.8%
	High-school diploma	2.7%	0.6%	2.8%	2.8%
Trade/technical/vocational degree or certificate		4.3%	6.3%	4.2%	8.3%
	Associate's degree	19.4%	18.5%	19.2%	20.8%
	Bachelor's degree	52.5%	42.2%	52.3%	54.2%
	Master's degree	13.1%	21.0%	13.5%	8.3%
Professional degree above a master's degree		2.3%	3.1%	2.4%	2.8%
	Doctorate degree	3.6%	4.9%	3.8%	0.0%
	No response	1.2%	1.2%	1.2%	0.0%
	Bachelor's degree or higher	71.5%	71.2%	72.0%	65.3%

Note: percentages may not sum to 100 due to rounding. n = 509 for respondents 25 years and older who are currently in school. n = 1,344 for respondents who are currently in school and for which urban-rural data are available.

What is the highest degree or level of school you have completed? *If you are currently enrolled in school, what is the highest degree you have received thus far?*

(n = 3,063)

			≥ 25	Urban	Rural
	GED or equivalent	3.4%	5.4%	3.4%	3.9%
	High-school diploma	24.0%	18.1%	23.4%	33.9%
Trade/technical/vocational degree or certificate	.....	3.6%	4.3%	3.7%	2.3%
	Associate's degree	15.7%	15.0%	15.4%	19.8%
	Some college	23.9%	20.7%	23.8%	24.3%
	Bachelor's degree	23.2%	27.3%	23.8%	12.4%
	Master's degree	4.4%	7.3%	4.5%	1.7%
Professional degree above a master's degree	.....	0.3%	0.4%	0.3%	0.0%
	Doctorate degree	0.3%	0.5%	0.3%	0.0%
	No response	1.3%	0.9%	1.3%	1.7%
	Bachelor's degree or higher	28.2%	35.5%	28.6%	14.1%

Note: percentages may not sum to 100 due to rounding. n = 1,662 for all respondents 25 years and older. n = 3,002 for which urban-rural data are available: n = 2,825 for urban respondents; n = 177 for rural respondents.

Inclusion and Belonging

Check all that apply. After my DACA application was approved, I...

(*n* = 3,063)

		≥ 25	Urban	Rural
Got my driver's license for the first time	79.7%	80.4%	79.6%	81.4%
Got a state identification card for the first time	55.1%	51.1%	55.4%	50.3%
Became an organ donor	48.7%	49.8%	48.8%	50.3%
Donated blood for the first time	17.8%	13.7%	17.7%	23.2%

Note: percentages do not sum to 100 as individuals may select all that apply. *n* = 1,662 for all respondents 25 years and older. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Please indicate the immigration status of your immediate family members, meaning a parent, sibling, spouse, or child. (select all that apply)

(*n* = 3,063)

		Urban	Rural
American citizen spouse	16.6%	16.4%	20.9%
American citizen child	25.7%	25.5%	27.7%
American citizen sibling	58.9%	58.9%	64.9%
American citizen spouse, child, or sibling	72.7%	72.7%	77.9%

Note: percentages do not sum to 100 as individuals may select all that apply. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Do you have an immediate family member, meaning a parent, sibling, spouse, or child, who is a U.S. citizen and is 18 years or older?

(*n* = 3,063)

		Urban	Rural
Yes	44.6%	44.5%	48.0%
No	55.0%	55.2%	50.9%
No response	0.4%	0.4%	1.1%

Note: percentages may not sum to 100 due to rounding. *n* = 3,002 for which urban-rural data are available: *n* = 2,825 for urban respondents; *n* = 177 for rural respondents.

Are any of your immediate family members who are U.S. citizens and are 18 years or older registered to vote?

(*n* = 1,365, which represents 44.6% of all respondents who have immediate relatives who are U.S. citizens that are 18 years or older)

			Urban	Rural
Yes	.....	81.5%	81.6%	80.0%
No	.....	18.3%	18.1%	20.0%
No response	.....	0.2%	0.2%	0.0%

Note: percentages may not sum to 100 due to rounding. *n* = 1,342 for respondents who have immediate family members who are U.S. citizens 18 years and older and for which urban-rural data are available.

What state do you currently live in?*(n* = 3,063)

	% Poll	% DACA
California	24.3%	28.3%
Texas	17.4%	15.8%
New York	4.8%	5.3%
Illinois	4.4%	5.4%
Arizona	4.1%	3.5%
Florida	3.3%	4.2%
North Carolina	3.1%	3.5%
Colorado	2.8%	2.2%
Washington	2.7%	2.3%
Georgia	2.6%	3.1%
New Jersey	1.9%	2.8%
Utah	1.9%	1.2%
Tennessee	1.5%	1.1%
Oregon	1.3%	1.4%
Maryland	1.3%	1.2%
Michigan	1.3%	0.8%
New Mexico	1.2%	0.9%
Massachusetts	1.2%	1.0%
Kansas	1.1%	0.9%
Pennsylvania	1.1%	0.7%
Virginia	1.1%	1.5%
Minnesota	1.0%	0.8%
Nevada	1.0%	1.7%
Oklahoma	1.0%	0.9%
South Carolina	1.0%	0.8%
Arkansas	1.0%	0.6%
Other	10.6%	8.1%

Note: percentages may not sum to 100 due to rounding.

What is your race/ethnicity?*(n* = 3,063)

White	1.7%
Black	1.1%
Hispanic/Latino	92.6%
Asian or Pacific Islander	3.5%
Other	0.9%
No Response	0.2%

Note: percentages may not sum to 100 due to rounding.

		%	%
		Poll	DACA
Hispanic/Latino	92.8%	93.5%	
Other	7.2%	6.5%	

How old are you?*(n* = 3,063)

Average	25.2
Median	25
16	0.4%
17	1.6%
18	3.0%
19	4.4%
20	5.2%
21	6.6%
22	7.6%
23	8.9%
24	8.0%
25	7.1%
26	8.6%
27	7.6%
28	7.3%
29	6.2%
30	5.3%
31	3.6%
32	3.3%
33	2.2%
34	1.8%
35	1.4%

Note: percentages may not sum to 100 due to rounding.

How old were you when you first came to the U.S.?

(*n* = 3,063)

Average	.....	6.5
Median	.....	6
0	.....	4.5%
1	.....	7.6%
2	.....	8.3%
3	.....	9.7%
4	.....	8.0%
5	.....	8.7%
6	.....	7.4%
7	.....	7.4%
8	.....	6.5%
9	.....	6.2%
10	.....	5.6%
11	.....	5.0%
12	.....	3.9%
13	.....	3.5%
14	.....	4.1%
15	.....	3.7%

Note: percentages may not sum to 100 due to rounding.

EXHIBIT 5



IMMIGRATION

DACA Recipients' Economic and Educational Gains Continue to Grow

By [Tom K. Wong](#), Greisa Martinez Rosas, Adam Luna, Henry Manning, Adrian Reyna, Patrick O'Shea, [Tom Jawetz](#), and [Philip E. Wolgin](#) | Posted on August 28, 2017, 9:01 am



AP/Craig Ruttle

Activists supporting Deferred Action for Childhood Arrivals (DACA) and other immigration issues gather near Trump Tower in New York, August 2017.

Note: The survey results can be found [here](#). As of November 2, 2017, the survey results have been updated to include breakdowns of urban and rural DACA recipients. For more information on the survey, please contact [Tom K. Wong](#).

Since it was first announced on June 15, 2012, the [Deferred Action for Childhood Arrivals](#) (DACA) policy has provided temporary relief from deportation as well as work authorization to approximately [800,000 undocumented young people](#) across the country. As [research has consistently shown](#), DACA has not only improved the lives of undocumented young people and their families but has also positively affected the [economy more generally](#), which benefits all Americans.

From August 1, 2017 to August 20, 2017, Tom K. Wong of the University of California, San Diego; United We Dream (UWD); the National Immigration Law Center (NILC); and the Center for American Progress fielded a national survey to further analyze the economic, employment, educational, and societal experiences of DACA recipients. This is the largest study to date of DACA recipients with a sample size of 3,063 respondents in 46 states as well as the District of Columbia.

The data illustrate that DACA recipients continue to make positive and significant contributions to the economy, including earning higher wages, which translates into [higher tax revenue](#) and economic growth that benefits all Americans. In addition, DACA recipients are buying cars, purchasing their first homes, and even creating new businesses. The survey's results also show that at least 72 percent of the top 25 Fortune 500 companies employ DACA recipients. Moreover, 97 percent of respondents are currently employed or enrolled in school.

DACA's impact on employment

Work authorization is critical in helping DACA recipients participate more fully in the labor force. The data show that 91 percent of respondents are currently employed. Among respondents age 25 and older, employment jumps to 93 percent.

After receiving DACA, 69 percent of respondents reported moving to a job with better pay; 54 percent moved to a job that "better fits my education and training"; 54 percent moved to a job that "better fits my long-term career goals"; and 56 percent moved to a job with better working conditions.

We also see that 5 percent of respondents started their own business after receiving DACA. Among respondents 25 years and older, this climbs to 8 percent. As the 2016 survey noted, among the

American public as a whole, the rate of starting a business is 3.1 percent, meaning that DACA recipients are outpacing the general population in terms of business creation.

As one respondent stated, “I started a bookkeeping business which gives me the opportunity to help our Hispanic community be in compliance with tax law [...] If DACA ended, I will not be able to keep my small business and help my community.”

Another respondent stated, “Because of DACA, I opened a restaurant. We are contributing to the economic growth of our local community. We pay our fair share of taxes and hire employees [...] It will be hard to maintain my business if DACA ended. I depend on my [social security number] for a lot of my business, such as when getting licenses, permits, leases, and credit.”

DACA's impact on earnings

The data make clear that DACA is having a positive and significant effect on wages. The average hourly wage of respondents increased by 69 percent since receiving DACA, rising from \$10.29 per hour to \$17.46 per hour. Among respondents 25 years and older, the average hourly wage increased by 84 percent since receiving DACA.

The data also show that respondents' average annual earnings come out to \$36,232, and their median annual earnings total \$32,000. Among respondents 25 years and older, the figures are \$41,621 and \$37,595, respectively. These higher wages are not just important for recipients and their families but also for tax revenues and economic growth at the local, state, and federal levels.

Last year, we noted that further research is needed to parse out the short- and long-run wage effects of DACA as well as whether short-run gains represent a plateau in earnings or if more robust long-run wage effects may exist. This remains true. However, as DACA recipients are now further along in their careers, and as we continue to see growth in their earnings, it is likely there is even more room for recipients' wages to grow.

The immediate impact of wage increases is evident in 69 percent of survey respondents reporting that their increased earnings have “helped me become financially independent” and 71 percent reporting that their increased earnings have “helped my family financially.” Among respondents 25 years and older, these percentages rise to 73 percent and 74 percent, respectively.

DACA's impact on the economy

The purchasing power of DACA recipients continues to increase. In the 2017 study, nearly two-thirds of respondents, or 65 percent, reported purchasing their first car. The average cost paid was \$16,469. As we have noted previously, these large purchases matter in terms of state revenue, as most states collect a percentage of the purchase price in sales tax, along with additional [registration and title fees](#). The added revenue for states comes in addition to the [safety benefits](#) of having more licensed and insured drivers on the roads.

The data also show that 16 percent of respondents purchased their first home after receiving DACA. Among respondents 25 years and older, this percentage rises to 24 percent. The broader positive economic effects of home purchases include the [creation of jobs](#) and the infusion of [new spending](#) in local economies.

Additionally—and importantly—the data show that at least 72 percent of the top 25 Fortune 500 companies—including Walmart, Apple, General Motors, Amazon, JPMorgan Chase, Home Depot, and Wells Fargo, among others—employ DACA recipients. All told, these companies account for [\\$2.8 trillion in annual revenue](#).

DACA's impact on education

Overall, 45 percent of respondents are currently in school. Among those currently in school, 72 percent are pursuing a bachelor's degree or higher. The majors and specializations that respondents report include accounting, biochemistry, business administration, chemical engineering, civil engineering, computer science, early childhood education, economics, environmental science, history, law, mathematics, mechanical engineering, neuroscience, physics, psychology, and social work, to name a few.

When it comes to educational attainment, 36 percent of respondents 25 years and older have a bachelor's degree or higher. Importantly, among those who are currently in school, a robust 94 percent said that, because of DACA, "I pursued educational opportunities that I previously could not."

Conclusion

Our findings could not paint a clearer picture: DACA has been unreservedly good for the U.S. economy and for U.S. society more generally. Previous research has shown that DACA beneficiaries will contribute [\\$460.3 billion](#) to the U.S. gross domestic product over the next decade—economic growth that would be lost were DACA to be eliminated.

As our results show, the inclusion of these young people has contributed to more prosperous local, state and national economies; to safer and stronger communities through increased access to cars and home ownership; and to a more prepared and educated workforce for the future. Ending DACA now would be counterproductive at best and, at worst, cruel. At present, 800,000 lives—as well as the lives of their families and friends—hang in the balance. At a time when the continuing existence of DACA is facing its most serious threat ever, understanding the benefits of the program for recipients; their families and communities; and to the nation as a whole is all the more important.

Tom K. Wong is associate professor of political science at the University of California, San Diego. Greisa Martinez Rosas is advocacy and policy director, Adam Luna is senior advisor for communications, Henry Manning is research fellow, and Adrian Reyna is director of membership and technology strategies at United We Dream. Patrick O'Shea is Mellon/ACLS public fellow at the National Immigration Law Center. Tom Jawetz is vice president for Immigration Policy and Philip E. Wolgin is managing director for Immigration Policy at the Center for American Progress.

The authors thank all those who took the survey for their time and effort in helping to bring these stories to light.

Methodology

The questionnaire was administered to an online panel of DACA recipients recruited by the partner organizations. Several steps were taken to account for the known sources of bias that result from such online panels. To prevent ballot stuffing—one person submitting multiple responses—the authors did not offer an incentive to respondents for taking the questionnaire and used a state-of-the-art online survey platform that does not allow one IP address to submit multiple responses. To prevent spoiled ballots—meaning, people responding who are not undocumented—the authors used a unique validation test for undocumented status. Multiple questions were asked about each respondent's migratory history. These questions were asked at different parts of the questionnaire. When repeated, the questions were posed using different wording. If there was agreement in the answers such that there was consistency regarding the respondent's migratory history, the respondent was kept in the resulting pool of respondents. If not, the respondent was excluded. In order to recruit respondents outside of the networks of the partner organizations, Facebook ads were also used. Because there is no phone book of undocumented immigrants, and given the nature of online opt-in surveys, it is not possible to construct a valid margin of error.

Center for American Progress



© 2018 - Center for American Progress

EXHIBIT 6



Companies

Markets

Tech

Media

U.S. ▼



Illegal Entrepreneurs

MARIA HAS NO U.S. VISA, AND JOSE'S EXPIRES SOON, YET THEY OWN A PROFITABLE CALIFORNIA FACTORY, PAY TAXES, AND CREATE JOBS.

By Julia Boorstin/Los Angeles

July 1, 2005

(FORTUNE Small Business) — José and "Maria" seem to be living the American dream. A wiry, mustachioed man in perpetual motion, José, 36, runs a profitable seven-year-old garment business in Southern California that brought in \$850,000 in sales and paid a six-figure tax bill last year, employing 25 people. Maria, 23, manages the firm's tidy, efficient office. They married in 2001, a year after José hired her, and last year purchased a two-bedroom ranch with a spacious backyard, where they live with their cherubic 3-year-old, George, and two dogs. But the life and the business they are creating could end abruptly. They're not citizens: Both arrived in the U.S. illegally, and they live with the threat of deportation.

José came to San Diego from Honduras in 1987 to escape poverty, living on the streets when he first arrived. He obtained a legitimate work permit, Social Security number, and driver's license in 1989 when the U.S. government granted "temporary protected status" (TPS) to undocumented Hondurans because of hurricane damage to their country. He pays \$500 a year to renew that status, which was extended to Hondurans through July 2006. Unless he gets a green card immediately after that, he could be deported. With immigrants filing six million applications for legal status annually and only about one million receiving approval, success is unlikely. The wait often takes 15 years or more. Maria, who entered the country as a child in 1988, has no legal documentation, not even a driver's license.

Introduced to FSB by an employee who liked the way they ran the company, the couple spoke to us on condition that we disguise their names and that we not report details that might reveal their identity. They wanted to tell their story to counter the argument that illegal immigrants represent a drain on the U.S. economy and to show that their contributions include founding companies and creating jobs.

Because José and Maria don't have an employer to sponsor them for green cards, their attorney has advised them to apply for the right to stay in the U.S. under a provision of immigration law that grants permanent legal residency to applicants who have invested \$1 million or more in the U.S. economy. Although José applied for permanent residency in 2000, a judge denied it, ruling that his business was not large enough to justify his moving here permanently, according to the couple's attorney. The attorney says that the hundreds of thousands of dollars in equipment they own doesn't count toward the minimum assets that are required for citizenship under current law, and based on precedents in which others have won citizenship, he has advised them to increase their annual profits to \$1 million as rapidly as they can. They hope to reach that goal by 2007 or 2008.

But there are no guarantees. And as José logs long hours at the factory, he dreams of visiting his ailing father in Honduras before it is too late. José hasn't been back since 1987; he can't leave the U.S. without a green card because he might never be able to return. "I think people like me who have been here for more than 15 years deserve green cards," he says above the din of the machines in his factory. "I spent \$68,000 on this machine, and I paid \$8,000 in sales tax. I've borrowed a total of \$200,000, and now I only owe \$10,000. If Bush sends me home because TPS expires or whatever, I can't take this factory with me. Who knows if they'll give me a chance to sell it before they make me leave?" José and Maria's options may change if the immigration reform that President Bush proposed last year passes in Congress. Bush's plan would let undocumented immigrants who have jobs apply to become legal temporary workers for three years; it would link other undocumented immigrants with companies that need employees for three-year periods. At the end, some workers would be allowed to apply for permanent green cards. Bush has argued that his proposal would help employers fill jobs that Americans don't want (at least not at existing wages) and let immigrants already here work legally without forfeiting ties to their home countries. In May legislators introduced a bill known as the Secure America and Orderly Immigration Act of 2005, which encompasses much of Bush's proposal. It doesn't, however, address the specific situation of illegal immigrants who are entrepreneurs. Millions of the nation's nine million to 20 million illegal immigrants could, however, become eligible for work permits if it passes. That would make it the most sweeping immigration proposal since President Reagan granted one-time amnesty to about 2.7 million illegal immigrants in 1986. Expect lots of shouting before Bush's reform comes up for a vote. Critics say that the proposal would increase competition against Americans looking for jobs. Advocates for the immigrants say the measure doesn't go far enough to help them, leaving their fate in the hands of big companies. And some illegal-immigrant entrepreneurs—scarcely considered in the debate so far—see no advantage in applying for legal status.

Consider "David" (not his real name), 36, a stocky Mexican immigrant with a sun-worn face who owns a pool-cleaning business in the San Fernando Valley. He doesn't pay taxes on the \$80,000 a year that he earns in cash, doesn't intend to apply for a green card no matter what happens in Congress, and plans to retire to Mexico. "I don't take anything from the government—no Social Security, no medical benefits—so why should I give them anything?" he asks, shrugging off any consideration of national defense and police protection.

But for business owners such as José and Maria, who have sunk deep roots here, the proposal offers tantalizing hope that the ambition and risk-taking spirit that propelled them across the border will pay off. "They understand America to be the land of opportunity, while they struggled with bureaucracy and corruption in their home countries," Jack Kyser, chief economist for the Los Angeles County Economic Development Corp., says of the area's illegal business owners. "They'll work very hard because they have no fallback plans." Kyser estimates that illegal immigrants who are paid off the books added \$163 billion to the \$673 billion of gross domestic product generated by businesses within Los Angeles and the four surrounding counties in 2003, the most recent year for which he has statistics. University of Southern California professor Harry Pachon, an expert on immigration, estimates that 8% to 10% of undocumented immigrants across the country run businesses, but notes that no one has gathered actual data.

Though living in the shadows of the U.S. Economy is difficult for José and Maria, they regard it as a big step up from conditions in their home countries. One of 11 children in a family so poor that he did not own shoes until he was 12, José couldn't find work in Honduras, so at 18, he illegally worked his way west and north into El Salvador, Guatemala, and Mexico. He took jobs at banana, mango, and sugar-cane plantations. One night, a year after he left Honduras, he sneaked into California near San Diego and traveled north by foot and bus. He knew no one in the U.S. and spoke no English. Sleeping on the streets of East Los Angeles, he waited each day with other immigrants at busy intersections to get construction and painting jobs, for which he was paid in cash. He sent much of his earnings to Honduras to buy his

Top Stories

[Trump ripe Fed for raising interest rates](#)

[24% of Tesla Model 3 orders have been canceled, analyst says](#)

[Domino's wants to open thousands of stores](#)

[How 2006 changed the Internet](#)

[Another Wells Fargo mess: Pet insurance ripoff](#)

More from FSB

[Help wanted for HR firm](#)

[A CEO and rodeo queen](#)

[King of the mountain bike](#)

Current Issue

parents a house and to help his older brother join him in the U.S. "The jobs that paid \$400 here would have paid \$50 in Honduras," José recalls.

Looking for a better-paying job, José traveled to Miami and then Boston, where he worked as a janitor until he realized that his poor English would prevent him from advancing. So he moved back to heavily bilingual Southern California, taking a job in a plastics factory, then in a sweatshop sewing dresses. Paid by the piece, he toiled without breaks for ten to 12 hours at a stretch. "We were taken advantage of. We didn't know any better," José says with a shrug. He still made it pay off. By working as many hours as he could, six or seven days a week, he brought home about \$400 a week, off the books. Since then, as his pay has soared, he's managed to send about \$400,000 back to his family in Honduras. The money has paid for eight houses for his siblings as well as an apartment building and a store for his sister to run. José's lucky break came when a buyer stopped by the factory where he worked, searching for a finishing that required a machine the plant didn't have. José, who had been saving money to start his own business, discreetly accepted the man's business card. Once José had saved \$15,000, he took out an equal-sized bank loan. His brother, who had obtained a green card with the help of his employer and had built up credit, co-signed the loan. José bought the specialty machine, phoned the buyer, and got his first order. He stayed up for two days straight to learn how to run the machine, then kept it going around the clock. He paid friends to run it while he handed out about 100 business cards a day to potential clients on the streets of the garment district. "I always wanted to work for myself," José says. "You get cheated otherwise." As clients referred more business his way, José hired employees, including relatives who had come across the border. Remembering how his former boss had cheated him, he always paid his workers by the hour, offering at least the minimum wage. Working long hours broke up his first marriage, to a Mexican woman who had also immigrated illegally, but by 2000 he had hired María, and they fell in love. That year his company hit about \$200,000 in revenue. María had much in common with José. When she was 7, her father, who had worked in the U.S. for five years, paid a "coyote" to smuggle her, her mother, her grandmother, and her 1-year-old sister across the border to escape poverty in Mexico. "We had to jump over a wall, and my grandmother got stuck on a spike. Her jacket stayed behind," she recalls. By her high school graduation, María had become fully bilingual and was an A student. The job as José's office manager felt familiar to her as soon as she arrived for her interview. Her father had worked in similar factories. Surprised that the company didn't have a computer, she began making improvements and soon played an integral role in growing the business.

A year after María joined the company, she and José married, and she soon became pregnant with their son. Her now flawless English and computer know-how helped her solicit customers. To achieve a particular effect that clients were seeking on their garments, José invested in a new machine but found it created new problems. "At first we lost thousands of dollars because we didn't have the right \$7,000 software to run the machine," he recalls. Once he had bought the software and hired more experienced workers, though, he found that the machine could do 18 times the work of his other devices, generating higher margins and allowing him to compete with the many sweatshops in his industry. To avoid any missteps that might derail their dream of becoming naturalized citizens, José and María have paid state and federal taxes each quarter. They use a federal-tax ID number that the government assigned the business, which they have incorporated in their names. They have obtained all necessary licenses. They contribute payroll taxes for their employees—even the third of them who are are illegal and use fake Social Security numbers bought on the street. The undocumented employees probably will never be able to reap government retirement benefits that they would accumulate if they were citizens. However, accepting the workers' phony Social Security numbers allows the factory to win jobs from large companies that require suppliers to show that all of their employees have this government identification.

With their company on track for about \$1.2 million in sales for 2005, María and José are charging ahead and trying to ignore the legal cloud that hangs over them. They are considering the purchase of the building that houses the factory, which would allow them to generate rental income from other tenants. Though he is concerned that overseas competitors could hinder his company's growth, José says he is committed to staying in the U.S. He is optimistic that his company will qualify as having \$1 million in profits over the next three or four years, which will allow him to reapply for a green card. But he hopes the President's plan will speed up the process. "I pay taxes. I want to do everything legally," José says in his heavy accent. "I would go to war for this country!"

More Small Business



[Contact Us](#)

[Closed Captioning](#)

[Site Map](#)



Most stock quote data provided by BATS. Market indices are shown in real time, except for the DJIA, which is delayed by two minutes. All times are ET. Disclaimer. Morningstar: © 2018 Morningstar, Inc. All Rights Reserved. Factset: FactSet Research Systems Inc.2018. All rights reserved. Chicago Mercantile Association: Certain market data is the property of Chicago Mercantile Exchange Inc. and its licensors. All rights reserved. Dow Jones: The Dow Jones branded indices are proprietary to and are calculated, distributed and marketed by DJI Opco, a subsidiary of S&P Dow Jones Indices LLC and have been licensed for use to S&P Opco, LLC and CNN. Standard & Poor's and S&P are registered trademarks of Standard & Poor's Financial Services LLC and Dow Jones is a registered trademark of Dow Jones Trademark Holdings LLC. All content of the Dow Jones branded indices © S&P Dow Jones Indices LLC 2018 and/or its affiliates.

© 2018 Cable News Network. A WarnerMedia Company. All Rights Reserved. Terms under which this service is provided to you. Privacy Policy.

EXHIBIT 7

Center for American Progress



IMMIGRATION

Assessing the Economic Impacts of Granting Deferred Action Through DACA and DAPA

By [Silva Mathema](#) | Posted on April 2, 2015, 12:00 pm



AP/J. Scott Applewhite

Members of the Congressional Hispanic Caucus hold a news conference to discuss their efforts to implement President Barack Obama's immigration executive action on the expansion rollout of the Deferred Action for Childhood Arrivals program, February 13, 2015, on Capitol Hill in Washington.

It has been four months since President Barack Obama announced the November 20 [immigration directives](#), which, among other common-sense immigration solutions, build on the [Deferred Action](#)

for [Childhood Arrivals](#), or DACA, program announced in June 2012. The November 20 directives expand the population eligible for DACA and establish a new policy called the [Deferred Action for Parents of Americans and Lawful Permanent Residents](#), or DAPA. These programs provide eligible undocumented immigrants a temporary reprieve from deportation and the ability to work lawfully for a temporary period of time. A number of entities—including the [Congressional Budget Office](#), the [Social Security Administration](#), and the [Council of Economic Advisers](#)—have analyzed the November directives and found that the policies will produce an array of positive economic and fiscal benefits.

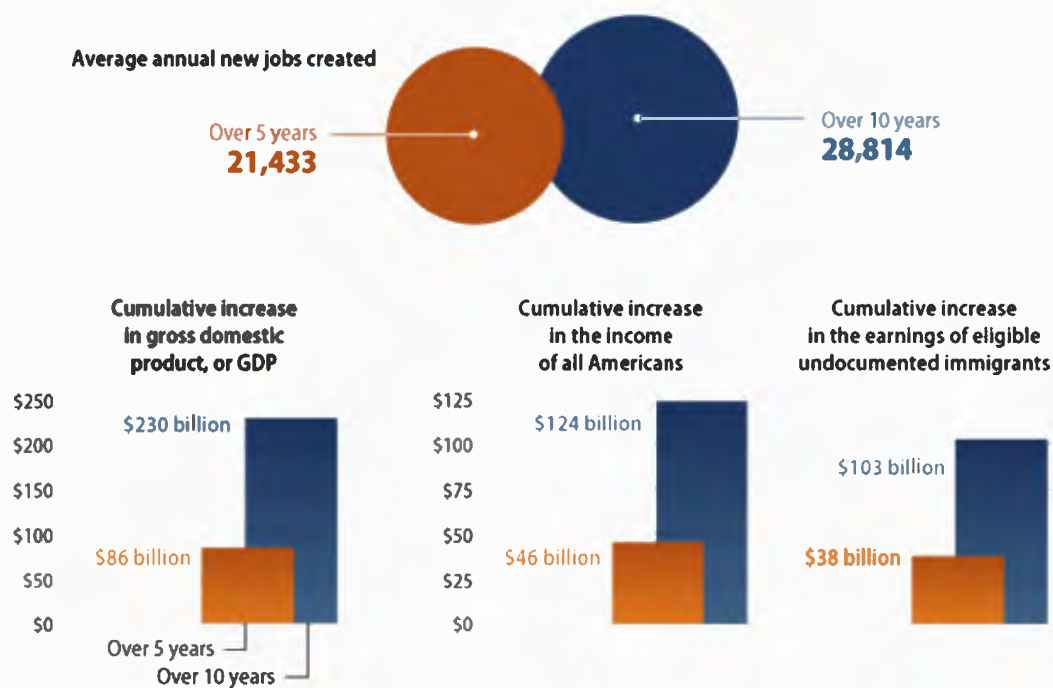
In this column, the analysis of the Center for American Progress zeros in on the estimated potential economic gains specifically associated with DACA and DAPA. In 2013, CAP published [a report](#) that estimated the effect of legal status and citizenship for the 8 million undocumented immigrants in the labor force. This column adopts the same methodology, updating it to fit the population eligible for a temporary reprieve from deportation through the three deferred action programs—the original DACA, the DACA expansion, and DAPA.

So why will the United States be better off economically when this eligible population receives deferred action? The answer is straightforward: When approximately [5.2 million](#) individuals are able to work legally and live without fear of deportation, they will [have greater](#) opportunities to find new jobs that match their skillsets and will be even more economically productive. Their lawful work authorization will make them less vulnerable to wage theft and workplace exploitation. These factors all lead to higher wages and more job security, which translate into more tax revenue generated and more economic activity across the nation.

FIGURE 1

The economic gains of granting deferred action to undocumented immigrants

Estimated economic gains in GDP, income, and jobs from DACA, DAPA, and the DACA expansion



Note: See Methodology section in the charticle text.

Sources: Migration Policy Institute, "Profile of the Unauthorized Population: United States," available at <http://www.migrationpolicy.org/data/unauthorized-immigrant-population/state/US> (last accessed March 2015); Congressional Budget Office, "The Budget and Economic Outlook: 2015 to 2025" (2015), p. 155, available at <https://www.cbo.gov/sites/default/files/cbofiles/attachments/49892-Outlook2015.pdf>; Bureau of the Census, "Table P-6. Regions—People by Mean Income and Sex: 1967 to 2013," available at <http://www.census.gov/hhes/www/income/data/historical/people/2013/p06AR.xls> (last accessed March 2015); Bureau of Economic Analysis, "Current-dollar and 'real' GDP," available at <http://www.bea.gov/national/index.htm#gdp> (last accessed March 2015); David Cooper, "Raising the Federal Minimum Wage to \$10.10 Would Lift Wages for Millions and Provide a Modest Economic Boost" (Washington: Economic Policy Institute, 2013), available at <http://www.epi.org/publication/raising-federal-minimum-wage-to-1010/>.

This analysis confirms that there is much to gain economically from enabling the DACA- and DAPA-eligible population to work lawfully. As DACA and DAPA recipients earn higher wages—an estimated total of \$103 billion more over the next decade—the U.S. gross domestic product, or GDP, will increase cumulatively by \$230 billion over the next 10 years. And it is not just beneficiaries of deferred action who will see wage gains: A booming economy will increase the incomes of all Americans by an estimated \$124 billion. The growth in economic activity will also create an average of 28,814 jobs per year over the next 10 years for all Americans.

These much-needed economic boosts to the economy are consistent with earlier estimates of large tax increases from the immigration directives: The Social Security Administration, for example, projects that the November directives alone will add **\$41 billion** in new tax revenue to the system over a decade. Similarly, a recent CAP study estimates that the temporary work permits could potentially raise payroll tax revenues by **\$22.6 billion** over five years.

Methodology

This analysis assumes that there are approximately 5.2 million immigrants eligible for DAPA and DACA, including the DACA expansion. We apply the general estimates of the number of undocumented immigrants in the labor force—72 percent of the total population—to get 3.7 million potential deferred action beneficiaries in the labor force. Unlike the Department of Labor’s previous estimate—which found that immigrants experience a 15.1 percent gain in income after moving from undocumented to documented status—this analysis uses the 8.5 percent wage gains from CAP’s earlier study, since deferred action is a temporary program.

We apply these assumptions and phase in the 8.5 percent increase over the first five years, with the full 8.5 percent gain applied over the latter five years. For a detailed discussion of the methodology, see Robert Lynch and Patrick Oakford, “The Economic Effects of Granting Legal Status and Citizenship to Undocumented Immigrants” (Washington: Center for American Progress, 2013), available at <https://cdn.americanprogress.org/wp-content/uploads/2013/03/EconomicEffectsCitizenship-1.pdf>.

Conclusion

Last December, 26 states—led by Texas—filed a lawsuit targeting the DACA expansion and the DAPA program. In February, Judge Andrew Hanen of the Southern District of Texas issued a preliminary injunction in the lawsuit, temporarily blocking these programs. He concluded that the states had standing to file suit because these programs will impose costs on Texas from issuing driver’s licenses to DACA and DAPA recipients. In making this determination, Judge Hanen neglected to consider the economic and fiscal benefits that DACA and DAPA will potentially generate. The Department of Justice, recognizing the big economic benefits from these deferred action programs, filed for an emergency stay at the 5th Circuit Court that asked to lift the judge’s ruling, and 14 states and the District of Columbia have filed an amicus brief in support of the stay.

The current analysis and other estimates that reveal the large economic gains from deferred action cast doubt on Judge Hanen’s ruling and the claims of economic harm to the states. The Texas lawsuit, as well as other legislative efforts to block DACA and DAPA, are fiscally and economically counterproductive. And yet even the ample economic benefits to the nation that would result from

providing deferred action to certain undocumented immigrants pale in comparison to those that would come with [comprehensive immigration reform](#) that includes a pathway to citizenship.

Rather than fighting this important—and temporary—administrative step, Congress and the states should be pushing for a lasting legislative solution that will realize the full economic potential of a 21st century immigration system.

Silva Mathema is a Policy Analyst on the Immigration Policy team at the Center for American Progress. She would like to thank Robert G. Lynch, Marshall Fitz, and Philip E. Wolgin for their invaluable input.

Center for American Progress



© 2018 - Center for American Progress

EXHIBIT 8

A New Estimate of the Cost of Reversing DACA

By Logan Albright
Ike Brannon
M. Kevin McGee

February 15, 2018

CATO WORKING PAPER
No. 49



*Cato Working Papers are intended to circulate research in progress for
comment and discussion.*
Available at www.cato.org/workingpapers.

A New Estimate of the Cost of Reversing DACA

Logan Albright¹

Ike Brannon²

M. Kevin McGee³

February 15, 2018

Abstract

We obtained data on the age and educational outcomes of nearly 3,000 college students who are DACA recipients—Deferred Action for Childhood Arrivals—and used it to forecast their income in the ensuing decade. We then used this data, along with the income we forecast for DACA recipients not in college, to estimate the total economic and fiscal impact over the next decade of allowing this cohort to remain in the country and legally pursue employment. We estimate that reversing DACA would cost the U.S. economy \$351 billion from 2019 to 2028 in lost income and that the U.S. Treasury would lose \$92.9 billion in tax revenue.

Background

As of our publication date, the status of the recipients of the Deferred Action for Childhood Arrivals—or DACA—has yet to be resolved. DACA provides work authorization and protections from deportations for individuals who were transported to the United States as children and who have since proven themselves to be productive members of society by meeting education benchmarks and having refrained from criminal activity. In October, President Trump announced that he was suspending the program—which was originally provided via an executive order from President Obama—but that he would delay its termination by six months to give Congress sufficient time to pass legislation to replace the executive order. Such legislation has proven elusive.

One argument put forth by those opposed to any renewal is that allowing these immigrants to remain in the country would impose a cost on U.S. taxpayers; a CBO study published in December 2017 estimates that legislation reinstating the legal status of the estimated 800,000 DACA immigrants would cost the federal government \$26 billion over the next ten years.⁴

These results were at odds with our own research published in early 2017.⁵ In that research, we stated that our *a priori* perspective was that cancelling DACA would make it nearly impossible for this cohort to obtain lawful employment and result in a reduction in tax revenues and economic activity in the domestic economy.

We estimated the economic and fiscal impact by extrapolating from related research that estimated the impact of expanding the pool of H-1B visa holders on economic activity.⁶ We compared the demographic characteristics of the H-1B population and the DACA population—in general DACA recipients are younger and a sizeable fraction will likely not complete college. The result is that their income is quite a bit lower than for H-1B holders but it grows at a faster rate. We then estimated income and tax revenue by using the estimates for the H-1B population and adjusting those numbers by the income path and population differences.

We determined that reversing the policy would cost the U.S. economy \$280 billion over a ten-year period, and that the resulting loss of government revenue would amount to roughly \$60 billion in that decade.

A Brief History of DACA

President Barack Obama first established DACA visa executive action in 2012. From 2012 to 2017, roughly 800,000 people received DACA status. While this population could attend most colleges despite their lack of a legal status, the program gave them a temporary work permit and a Social Security number, which allowed them to work as well.

During his presidential campaign, Donald Trump promised to rescind DACA early in his presidency, and in September of 2017, the Attorney General announced that the program was, in fact, being suspended, with DACA recipients given up to a six-month grace period to get their affairs in order. The president challenged Congress to pass its own legislation to protect the status of DACA recipients, and at various times indicated that he felt some empathy for their plight and wanted a humane and reasonable solution of the issue.

This announcement was met with multiple legal challenges from state governments and individuals alike. The U.S. District Court of the Northern District of California has ruled that the reversal of DACA was unlawful, and has ordered the government to continue the program until further notice.

One proposed bill under consideration is the DREAM Act of 2017. The Congressional Budget Office estimated that it would increase budget deficits by approximately \$26 billion over the next decade.⁷ The rationale given for this result is that immigrants without work permits pay certain taxes, most notably payroll taxes, but cannot claim benefits. By granting them legal status these workers become eligible for various benefit programs and Social Security but without paying much more in federal income taxes.

The DACA Population

To understand the economic impact of reversing DACA it helps to understand what distinguishes DACA recipients from other cohorts of legal and illegal immigrants. Since the DACA population grew up in the United States, they more closely resemble native-born Americans and second-generation immigrants more than first-generation immigrants. Having experienced the American school system and a peer group comprised mainly of Americans, the difficulties presented by language barriers, culture shock, and other obstacles to assimilation have dissipated, thus affording DACA recipients more opportunities for economic success than immigrants as a whole.

Moreover, DACA recipients must necessarily be free from criminal activity, as well as have the ability to enroll and remain in some sort of post-secondary education in order to qualify for the program, leaving us with a cohort that has largely performed well in school and stayed out of trouble.

Analysis done by the Center for American Progress found that DACA recipients tend to perform well in post-secondary education and have lower attrition rates than their peers.⁸ A primary reason for this is that the opportunity cost for a DACA student to leave school before completion is higher than for a native student: it is more difficult for DACA students to procure financial aid or scholarships and it becomes nearly impossible to do such a thing if a student leaves school for a spell.

The Migration Policy Institute (MPI) estimated that in 2014 nearly half of the DACA-eligible population who have completed a high school degree had no further education, with an additional 29 percent enrolled in college, 16 percent having completed some post-secondary education, and only 7 percent with college degrees.⁹ Since DACA enrollment only began in

2012, this paucity of college graduates is understandable; more impressive is the surge in college enrollment. For the rest of the U.S. population, approximately 60 percent of high school graduates attended some sort of post-secondary institution and one third of the population eventually obtained a college degree.

These numbers would presumably have been even higher had MPI been able to look only at DACA enrollees. They estimated that in 2016, only 68 percent of the DACA-eligible population enrolled in the program. Clearly, those with at least some post-secondary education have a greater incentive to apply for DACA status than the average DACA-eligible person, since that status opens up legal employment opportunities that substantially increase with education. Therefore, we conclude that those with DACA *status* have a higher college enrollment rate as compared to the entire population of DACA-eligible unlawful immigrants.¹⁰ From that, we assume that the college-enrollment rate among DACA enrollees is around 40 percent in 2014, about a third higher than for all DACA-eligibles, which would in turn suggest that by 2019 the current DACA-enrolled population will be--roughly--evenly divided between those with only a high school degree, those with some post-secondary education, those currently in college, and those with college degrees.¹¹

Methodology

Estimating the economic production and tax revenues that DACA enrollees are likely to generate over the next decade entails three steps. First, we needed to generate a profile of the DACA-eligible population over time, as its members move from high school either directly into the workforce, or through post-secondary education and then into the workforce. That profile needs to include reasonable transition probabilities that would estimate both high school and college drop out rates that are consistent with the patterns observed in the data.

Second, we needed to estimate reasonable age-earnings profiles for three groups of DACA-eligible individuals: those projected to have only high school degrees, those projected to have some college or other post-secondary education but no degree, and those projected to complete college. Finally, we needed to estimate how many of those DACA-eligible individuals would in fact apply for and be approved for DACA status.

DACA-eligible Workforce Entry

We used Migration Policy Institute research on the characteristics and numbers of the DACA-eligible population to estimate the distribution of educational attainment for this population.¹² Using the Hispanic dropout rates in the Census Department's CPS Historical Time Series Tables on School Enrollment, we generated a plausible pattern of DACA-eligible high school enrollment, which gradually tapered from 98,000 freshmen in 2012 to 8,000 freshmen in 2023.¹³ We then assumed that 35 percent of these high school graduates would move directly into the workforce. MPI estimated that there were 396,000 DACA-eligible high school graduates in 2014 who were not pursuing additional education, which would then imply that 309,000 DACA-eligible, unlawful immigrants had already graduated from high school by 2011.

The remaining high school graduates were divided between college enrollment (50 percent) and other post-secondary enrollment (15 percent). Even those numbers were insufficient to generate MPI's estimate of 241,000 DACA-eligible college enrollees in 2014; so we assumed a surge of over 95,000 college enrollees in 2013, from among the population that had previously graduated from high school. Our estimates imply that by 2033, 36.35 percent of the DACA-eligible population will have college degrees, in line with Census department's 2017 estimate that by the age of 34, 36.4 percent of Hispanics who graduate from high school have gone on to earn college degrees.¹⁴

We assumed that college enrollees have an 81 percent graduation rate, consistent both with the rates observed by thedream.us, an organization that provides scholarship money for DACA students to help cover the cost of college. This is above the national 6-year graduation rates for full-time college students; we attribute this to the fact that a substantial proportion of our sample obtained an associate's degree, which is a common step for this cohort seeking post-college education. We assumed that enrollees in other post-secondary programs had a 50 percent annual attrition rate, either from dropping out or from completion of their program. This gave a flow of DACA-eligibles into the workforce that includes about 44,000 college graduates per year between 2017 and 2023.

We then had to reduce this workforce-entry flow for two reasons. First, not all high school graduates are in the labor force, and not all labor force participants are employed as the population includes those who are unemployed but looking for work. The Bureau of Labor

Statistics (BLS) reports a 75.3 percent employment-population ratio among Hispanics age 25 to 34, so we reduced our estimates of labor force entrants accordingly.¹⁵

Secondly, not all DACA-eligible unlawful immigrants apply for, or are granted, DACA status. MPI estimated that 68 percent of DACA-eligibles have applied for that status with an acceptance rate above 95 percent.¹⁶ We reasoned that since the benefits of DACA status are greater the greater one's earnings potential, we ascribed DACA status to all of the DACA-eligibles with some college or a college degree, but to only one-third of those with only high school degrees. Those assumptions imply that DACA status will slowly rise to 68.8 percent of the eligible population by 2028. If DACA is not just reinstated as a temporary, 2-year renewable status, but is legally enshrined in a permanent status, we would expect DACA participation to rise and the revenue impacts of DACA will increase accordingly.

DACA-eligible Age-earnings Profiles

The estimated age-earnings profiles of DACA-eligibles with only high school or some college are based on the corresponding median 2017 weekly earnings for Hispanics as reported by the BLS.¹⁷ For individuals with high school degrees only, median earnings were \$33,852 a year; using Thornton and his coauthor's research, real earnings rise by about 1 percent a year until about age 40, and are flat thereafter.¹⁸ The resulting pattern begins at about \$27,500 at age 19, when these individuals are assumed to enter the workforce, and rises to the median wage by age 40.

For individuals with some college, median earnings were \$38,324 a year. According to Tamborini and his coauthors, median earnings for these workers are 5.6 percent higher than their high school-only counterparts for those aged 20-29, and 12.6 percent higher for those aged 30-39.¹⁹ The resulting estimated real earnings profile consistent with these values rises from \$28,000 at age 21 to \$39,300 at age 40.

We assigned the starting median salary to all employed DACA-participating individuals at the beginning of their work careers and assumed that their real incomes would rise with age according to the rates above. In reality, some individuals will earn more than those median earnings, and others less. The progressivity of the tax code implies that our revenue estimates for these workers will understate the true revenue impacts, although probably not by much, since

most of these individuals will remain in a relatively low tax bracket regardless of how much they vary from the median. Their estimated taxes were based on the tax rates adopted in December 2017 for single individuals. For years after 2018, nominal tax payments were inflated using an annual 2 percent inflation rate. Per CBO custom, we do not discount the income or tax revenues of future years.

To estimate the earnings of the DACA college graduates, we obtained data from thedream.us. Just under 3,000 students have received financial assistance from thedream.us. For these individuals, we have data on the college in which they are currently enrolled, their expected graduation, their choice of major, previous post-secondary education (a substantial proportion have already earned an associates degree), and their city and state of residence. While we do not have data on their academic performance, a student's area of study is much more relevant to post-college income.

We paired the educational data with income data we obtained from the financial technology company payscale.com, which has an estimated starting salary for college students based on degree, school, and major using reported salary data.²⁰ Our data set had 2,563 usable observations with sufficient data to assign an estimated starting salary. To generate an age-earnings profile, we used estimates from Thornton and his coauthors that found that salaries initially grow at a 4 percent real annual rate, gradually tapering to a 3 percent real annual rate after 10 years.

To account for the fact that most college students begin their employment careers mid-year, we reduced first-year salaries by 60 percent. With this group as well, our tax estimates were based on the tax rates adopted in December 2017 for single individuals. We calculated estimated taxes for each individual for each year in their earnings profile, and then averaged over our entire sample, giving us a profile of average tax payments per college graduate that does account for earnings variability. As with the other two groups, we ascribed these average tax payments to each individual college graduate, beginning in the year they enter the labor force. Once again, we reduce the number of entrants to 75.6 percent of all graduates to reflect employment rates, and inflate nominal payments by a 2 percent inflation rate.

Three Possible Scenarios

The estimate derived above assumes that current DACA recipients are offered a legal way to stay in the country, attend university, and obtain productive employment. From a fiscal standpoint, this would be the most preferred outcome but two others are also possible. The second scenario is that DACA ends and the immigrants currently in the country under its protection will be deported to their countries of origin. Under this scenario, the U.S. government does not only fail to gain any tax revenue from current DACA recipients, but also has to locate and deport 800,000 individuals, a task that would cost over \$10 billion if it were feasible.²¹

The more likely scenario if Congress fails to reach a deal and current DACA recipients lose their legal status is that the vast majority remain in the country illegally and work largely in jobs that require little skill but can be done on a cash basis, allowing them to receive their wages under the table. A proportion might be able to obtain employment by using another person's Social Security Number, a common ruse, which would force them to pay income and payroll taxes, albeit without any ability to collect Social Security or other benefits. Of course, as residents and consumers, they would also continue to pay sales and excise taxes. Given that this activity would happen outside of the law, it is impossible to estimate the revenue impact beyond saying that it would fall somewhere between the first two scenarios.

Estimating the Income and Tax Impacts of Repealing DACA

From the above analysis, we projected the number of DACA recipients in each of the four educational attainment categories for each year and then assigned them an income based on their experience and educational attainment by education (Table 1). For the college graduates we estimated a starting salary based on school and choice of major. The average DACA recipient will earn a salary of approximately \$73,921 per year for the 10-year period from 2019 to 2028. These earnings represent an equivalent gain to U.S. gross domestic product. Factoring in the 75.6 percent employment rate cited above and multiplying by the total number of DACA recipients, we estimate the ten-year GDP impact to be \$351 billion.

Table 1
DACA Recipients by Educational Category

	2019	2021	2023	2025	2027
Number					
HS degree only	184,767	199,719	209,687	216,031	218,749
Enrolled in College	193,389	165,564	122,726	81,945	47,128
Some college	190,547	208,521	221,908	231,164	236,846
College degrees	245,305	311,468	376,693	430,371	467,533
Total	814,008	885,272	931,014	959,511	970,256
Percentages					
HS degree only	22.7%	22.6%	22.5%	22.5%	22.5%
Enrolled in College	23.8%	18.7%	13.2%	8.5%	4.9%
Some college	23.4%	23.6%	23.8%	24.1%	24.4%
College degrees	30.1%	35.2%	40.5%	44.9%	48.2%
	100.0%	100.0%	100.0%	100.0%	100.0%
Average Earnings					
HS degree only	\$30,332	\$32,019	\$33,844	\$35,816	\$37,959
Enrolled in College	\$0	\$0	\$0	\$0	\$0
Some college	\$32,736	\$34,878	\$37,211	\$39,764	\$42,564
College degrees	\$63,216	\$69,963	\$76,810	\$84,671	\$93,383
Total	\$33,598	\$40,054	\$47,569	\$55,621	\$63,946

Note: "Some college" includes those with more than a high school and less than a college degree who are not currently enrolled in college.

Applying the appropriate tax rates, we also determined that government would gain \$39.2 billion in revenue from DACA recipients over the next ten years. Additionally, we can expect a FICA tax rate of 15.3 percent, resulting in payroll tax revenue of \$53.7 billion over the next ten years. Therefore, the total tax revenue impact would be \$92.9 billion.²² The imputed tax revenue adds up to 25 percent of projected income, the majority of which is driven by FICA.

We projected out an additional year and found that, from the ten-year period comprising 2020 through 2029, the GDP impact would be \$384 billion, and the revenue impact would be \$43.6 billion. If we include the FICA tax (both the employer and employee share), we add an additional \$58.8 billion, for a total tax impact of \$102.4 billion.

It should be noted that salary estimates are based on data that are a few years old and may understate current incomes, and there is reason to believe that incomes will grow faster than

during the previous decade. These estimates do not include the cost of actually tracking down and physically removing all 690,000 DACA recipients from the country, a significant expenditure in itself that would increase the fiscal costs of DACA.

Comparisons with Other Estimates

The above-mentioned Congressional Budget Office score the DREAM Act finds significantly lower revenue gains from DACA recipients than we do here.²³ There are several reasons for this. The first is that CBO regards the income of DACA recipients as merely switching over from “underground” to legal status, and does not believe that this would result in much of a gain in income for those workers, an assumption that we think is without merit. What’s more, the legislation would make these people become eligible for a large number of federal government welfare programs, which it believes would outweigh any tax revenue boost from their newfound legality.

CBO’s methodology essentially assumes the formal employment of DACA recipients merely transfers income from the employer (who would have been taxed on that income had the employee not been hired) to the employee (who is then taxed on the transferred income). The CBO’s estimate also contains offsets for health insurance premium support offered through the Affordable Care Act. However, our analysis suggests that DACA recipients who complete college--a significant proportion of the cohort--become significantly less likely to qualify for premium support soon after completing college.

Finally, CBO makes no allowance for the effects of education and specialization, conducted in a legal environment, on income. DACA recipients who complete college have the potential for considerable income growth, which would result in higher tax obligations and more revenue to the federal government. For these reasons, we estimate that the revenue cost to the federal government of reversing DACA would be substantially higher than the estimate implicitly contained in the DREAM Act.

It should also be noted that our cost estimates look only at the cost of fully reversing the current DACA program, whereas the DREAM Act contains other provisions providing a path to citizenship for immigrants beyond the status quo. A full scoring of the DREAM Act is beyond

the scope of this paper, and the differences found in this somewhat apples-to-oranges comparison are to be expected.

Conclusion

Our revised findings from data of DACA recipients currently matriculating are consistent with our previous analysis and suggest that ending the deferred arrivals program would represent a significant cost to the United States Treasury and the broader economy. We estimate that reversing DACA would cost the U.S. economy \$351 billion from 2019 to 2028 in lost income, and that the U.S. Treasury would lose \$92.9 billion in revenue, including payroll taxes.

¹ Director of Research at Free the People, labright@freethepeople.org

² Visiting fellow at the Cato Institute, ike.brannon@gmail.com

³ Professor emeritus at the University of Wisconsin Oshkosh, mcgee@uwosh.edu

⁴ “S. 1615, Dream Act of 2017,” Congressional Budget Office Cost Estimate, December 15, 2017, <https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/s1615.pdf>.

⁵ Ike Brannon and Logan Albright, “The Economic and Fiscal Impact of Repealing DACA,” Cato-At-Liberty, January 18, 2017, <https://www.cato.org/blog/economic-fiscal-impact-repealing-daca>.

⁶ Thomas V. Church, “Estimating the Economic and Budgetary Effects of New H-1B Visas in the Senate Gang of Eight’s Proposed Immigration Bill,” Hoover Institution (Stanford: Hoover, May 7, 2013), <http://www.hoover.org/sites/default/files/uploads/aafs/2013/05/Estimating-the-Economic-and-Budgetary-Effects-of-H-1B-Reform-In-S.744.pdf>.

⁷ “S. 1615, Dream Act of 2017,” Congressional Budget Office Cost Estimate, December 15, 2017, <https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/s1615.pdf>.

⁸ Tom K Wong, “Results of Tom K. Wong, National Immigration Law Center, and Center for American Progress national survey National Immigrant Law Center,” *Center for American Progress Memo*, June 2015.

⁹ Randy Capps, Michael Fix, and Jie Zong, “The Education and Work Profiles of the DACA Population,” Migration Policy Institute, August 2017, <https://www.migrationpolicy.org/research/education-and-work-profiles-daca-population>, p. 4.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ “CPS Historical Time Series Tables on School Enrollment,” U.S. Census, August 23, 2017, <https://www.census.gov/data/tables/time-series/demo/school-enrollment/cps-historical-time-series.html>.

¹⁴ “Educational Attainment in the United States: 2017, U.S.,” U.S. Census, December 14, 2017, <https://www.census.gov/data/tables/2017/demo/education-attainment/cps-detailed-tables.html>, Table 1.

¹⁵ “Labor Force Statistics from the Current Population Survey,” Bureau of Labor Statistics, January 19, 2018, <https://www.bls.gov/cps/cpsaat04.htm>.

¹⁶ Randy Capps, Michael Fix, and Jie Zong, "The Education and Work Profiles of the DACA Population," Migration Policy Institute, August 2017, <https://www.migrationpolicy.org/research/education-and-work-profiles-daca-population>, p. 3.

¹⁷ "Usual Weekly Earnings of Wage and Salary Workers, Fourth Quarter 2017," Bureau of Labor Statistics, News Release, January 17, 2018, <https://www.bls.gov/news.release/pdf/wkyeng.pdf>.

¹⁸ Robert Thornton, James Rogers and Michael Brookshire, "On the Interpretation of Age-Earnings Profiles," *Journal of Labor Research* 18(2) 1997, Table 4.

¹⁹ Christopher R. Tamborini, ChangHwan Kim and Arthur Sakamoto, "Education and Lifetime Earnings in the United States," *Demography* 52 2015.

²⁰ Payscale.com, About Us Page, <https://www.payscale.com/about>

²¹ John Hudak and Elaine Kamarck, "The Mind-Boggling Cost of DACA Repeal," Brookings Institution, September 7, 2017, <https://www.brookings.edu/blog/fixgov/2017/09/07/the-mind-boggling-cost-of-daca-repeal/>.

²² We assume that the personal tax rates will not change and ignore the fact that current law repeals them in 2026.

²³ "S. 1615, Dream Act of 2017," Congressional Budget Office Cost Estimate, December 15, 2017, <https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/s1615.pdf>.

EXHIBIT 9



INSTITUTE ON TAXATION AND ECONOMIC POLICY
(<https://itep.org/>)

April 25, 2017

State & Local Tax Contributions of Young Undocumented Immigrants (2017)

REPORT (/category/reports)

This report was updated in April 2018 (<https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants-2/>)

Read as PDF (Includes Appendices of State-by-State Data) (<http://itep.org/wp-content/uploads/2017DACA.pdf>)

Leer en Español (<http://itep.org/wp-content/uploads/DACA-Spanish.pdf>)

View updated data as of December 2017 (<https://itep.org/updated-tax-contributions-of-young-undocumented-immigrants/>)

Introduction

The Trump administration's immigration policies have broken apart families and removed established members of communities. The administration's disregard for the contributions of immigrants, regardless of their legal status, is of real concern for young immigrants whose parents brought them to the United States as children. Many of those young immigrants qualify for deferred deportation action and legal work authorization under Deferred Action for Childhood Arrivals (DACA), a 2012 executive order under President Barack Obama.

While it remains unclear what actions, if any, President Trump will take to amend DACA, the policy guidance the president has given to federal agencies has resulted in detentions and deportations of individuals reportedly eligible for deferred action. The ambiguity of the Trump Administration's statements and actions relating to the DACA program makes it essential that clear and accurate data about the DACA population is available.

More than 1.3 million out of the 11 million undocumented immigrants living in the United States are eligible for DACA. As of September 2016, more than 852,000 individuals were enrolled in the program.^[i] DACA offers eligible teenagers and young adults who were brought to the United States as children outside of their control temporary deferral from deportation and legal work authorization.^[ii]

DACA enrollment has helped young immigrants become more engaged in their communities. A national survey of DACA enrollees in 2016 found that more than 40 percent of respondents secured their first job after enrollment in DACA, and more than 60 percent landed a job with better pay. DACA enrollment also allowed 60 percent of respondents to pursue educational opportunities that were previously unavailable to them. The young immigrants enrolled in DACA work in diverse industries, including educational and health services, wholesale and retail trade, and professional and business services.

The 1.3 million young immigrants eligible for deferred action contribute tax dollars to communities that help pay for schools, public infrastructure, and other services. Their contributions could be increased by taking steps to ensure that all individuals eligible for deferred action are enrolled, or even by offering a path to citizenship. Conversely, stripping their temporary lawful status or deporting them would decrease their tax contributions and deprive our country of a dedicated and diverse generation.

An ITEP report from March 2017 found the 11 million undocumented immigrants living and working in the United States contribute more than \$11.74 billion in state and local taxes.^[iii] This report specifically examines the state and local tax contributions of undocumented immigrants who are currently enrolled or immediately eligible for DACA and the fiscal implications of various policy changes. The report includes information on the national impact (Table 1) and provides a state-by-state breakdown (Appendix 1).

Key Findings

- The 1.3 million young undocumented immigrants enrolled or immediately eligible for DACA **contribute an estimated \$2 billion a year** in state and local taxes.^[iv] This includes personal income, property, and sales and excise taxes.
- DACA-eligible individuals pay on average **8.9 percent of their income** in state and local taxes. Their effective tax rate is higher than the average rate paid by the top 1% of taxpayers in state and local taxes of just 5.4 percent and is on par with the average rate paid of 9.4 percent paid by the middle 20 percent

of taxpayers.[v]

- Continuing DACA and ensuring all who are eligible for the program are enrolled would **increase estimated state and local revenue by \$425 million**, bringing the total contribution to **\$2.45 billion**, and increasing the effective tax rate for those enrolled to 9 percent.
- Replacing DACA with a path to citizenship could provide **nearly \$505 million in additional state and local taxes**, **increasing total contributions to at least \$2.53 billion a year**.
- Repealing the temporary legal status and work authorizations permitted by DACA would **reduce estimated state and local revenues by nearly \$800 million**, and drop the total contributions to just over \$1.2 billion annually.
- Every state benefits from the economic contributions of the young immigrants eligible for DACA (see Appendices 1 and 2). For example, the 379,000 young immigrants living in California are contributing more than \$534 million to the golden state while the 2,000 immigrants in our nation's capital contribute \$2.7 million to the District. Likewise, every state stands to lose considerable revenue if we do not maintain the protections and opportunities DACA has allowed.

How federal policy changes in the treatment of young immigrants affect state and local revenues

Questions have frequently been raised about the taxes paid by undocumented immigrants. Everyone living and working in the U.S. contributes to state and local taxes, regardless of their immigration status. We all pay sales and excise taxes when we purchase goods and services such as clothing or gasoline. We all pay property taxes either directly for our homes or indirectly as renters.

As ITEP's March report demonstrated, about half of undocumented immigrants file income tax returns. They do this using Individual Taxpayer Identification Numbers (ITINs) in the absence of having valid Social Security numbers. Because DACA provides young immigrants with work authorization, recipients are subject to the same state and local personal income tax laws as all lawfully present workers. DACA recipients do have (temporary) Social Security numbers.

The tax revenues generated by DACA recipients are further boosted by the fact that DACA status boosts employment rates and wages. A national survey of DACA recipients found that employment rates increased by 36 percentage points after enrollment, from 51 percent of respondents employed to 87 percent.[vi] Evidence also shows that relief from deportation and temporary work permits through programs like DACA also boosts undocumented immigrants' wages by at least 8.5 percent. When given the opportunity to work legally and a reprieve from deportation DACA recipients are able to work more, earn more wages, and are less likely to be victims of wage theft from unscrupulous employers.

Table 1: U.S. Total of State and Local Tax Contributions of DACA-eligible individuals

Current and potential contributions of individuals currently receiving or eligible for DACA status

	Currently receiving DACA (852,000)	Currently eligible but not receiving (452,900)	Total DACA-eligible population (1.3 million)	Change from Current Contribution
Current Taxes	\$1,603,068,000	\$423,765,000	\$2,026,833,000	—
Taxes if All Eligible Receiving	\$1,603,068,000	\$849,546,000	\$2,452,614,000	+\$425,781,000
If granted citizenship	\$1,654,779,000	\$876,951,000	\$2,531,730,000	+\$504,897,000
If DACA protections lost	\$805,751,000	\$423,765,000	\$1,229,516,000	(\$797,317,000)

Based on this evidence, we assume that 87 percent of the 852,000 young immigrants currently enrolled in DACA are employed, and that they are earning, on average, 8.5 percent more than the estimated 452,900 young people eligible for but not receiving DACA. The higher earnings, higher employment rate, and higher tax compliance rate of individuals enrolled in DACA leads to their increased tax contributions and higher effective tax rate compared to those eligible for but not receiving DACA. The total contributions of individuals currently receiving or eligible for DACA status is just over \$2 billion in state and local taxes annually. If all eligible individuals were enrolled in DACA, those state and local tax contributions would increase by more the \$425 million due to higher earnings, higher employment rate, and 100 percent tax compliance for all DACA eligible immigrants (see Table 1).

Granting DACA eligible immigrants a path to citizenship would provide an even larger wage boost. A 2013 analysis by the Congressional Budget Office estimated a 12 percent wage boost for undocumented citizens who were granted a path to citizenship.[vii] State and local revenues would net an additional \$505 million if the 1.3 million young people currently eligible for or receiving DACA were granted a path to citizenship (see Table 1).

In contrast, failing to maintain work authorizations and deportation relief of DACA would hurt state and local coffers. If the 852,000 young immigrants currently enrolled lost the protections of DACA, it would reduce their state and local tax contributions by nearly \$800 million (see Table 1).

Just as every state benefits from the tax contributions of young undocumented immigrants every state has much more to lose if we remove the protections and work authorization granted to these young immigrants who were brought to the United States as children and have always considered it home. If the Trump administration fails to protect this population from deportation, the nation risks forcing them back into the shadows and losing the economic and societal contributions these engaged young people are making in their communities.

Methodology

ITEP estimates the state and local tax contributions of DACA-eligible immigrants under different policy options through the methodology detailed below.

1. Estimated DACA-eligible and enrolled population in each state

- The number of young immigrants in each state immediately eligible for DACA comes from the Migration Policy Institute.^[viii] MPI estimated just under 1.3 million young immigrants nationwide are immediately eligible for DACA. MPI's estimates are limited to 41 states and the District of Columbia. To calculate the eligible population in the nine missing states, ITEP used the enrollee data (see below) for each state to estimate a total eligible population (see Appendix 2).
- The number of people currently enrolled in DACA nationally (852,000) and in each state comes from the United States Citizenship and Immigration Services^[ix]. (see Appendix 2).

2. Taxpaying units and employment status

- This analysis treats each DACA-eligible immigrant who is working as a single taxpaying unit.
- The employment rate of immigrants depends on legal status. A 2016 national survey of 1,308 DACA recipients found that 87 percent of respondents were employed, compared to only 51 percent before gaining lawful status. The assumed employment rate of DACA-eligible immigrants with legal status, either those participating in the program or granted a pathway to citizenship, is 87 percent. The assumed employment rate of DACA-eligible immigrants who are not enrolled in the program is 51 percent.^[x] Additionally, to calculate the impact on tax contributions if DACA protections are removed, 51 percent was applied to the total DACA-eligible population.
- Here's how the national numbers break down (see Appendix 2 for state numbers):

	Population	Workforce Participation %	Estimated Workers
Eligible DACA Population	1,304,900		
Enrolled DACA Population	852,000	87%	740,400
Eligible, but unenrolled DACA Population	452,900	51%	232,300
Eligible, but no DACA protections		51%	669,400

3. Income

- Immigrant wages change depending on legal status. Undocumented workers earn \$22,029 a year on average and granting DACA status increases wages by 8.5 percent, according to a 2014 report by the Center for American Progress^[xi]. Putting immigrants on a path to citizenship would carry a larger effect, since it grants rights and protections associated with permanent residence. The Congressional Budget Office estimates a path to citizenship would boost wages by 12 percent^[xii]. The average wages applied to the estimated DACA working population in this analysis are:
 - o \$23,901 for the DACA-eligible population working and enrolled in the program.
 - o \$22,029 for the DACA-eligible population working, but not enrolled in the program.
 - o \$24,673 for the DACA-eligible population working and granted a pathway to citizenship.

4. Estimated effective tax rates (taxes as share of income) for sales, income, and property taxes paid by DACA-eligible population in each state^[xiii]

ITEP's microsimulation computer model is a sophisticated program that applies the state and local tax laws in each state (including sales, excise, income, and property tax laws) to a statistically valid database of tax returns to generate estimates of the effective tax rates paid by taxpayers at various income levels under state and local tax law in place as of December 31, 2014. In January of 2015, ITEP released the 5th edition of *Who Pays?* which estimates the effect of the state and local tax laws as of January 2015 on taxpayers at 2012 income levels. This report applies effective tax rates calculated in the 2015 *Who Pays?* report to the DACA eligible population.

The following assumptions were made to calculate the sales and excise, income, and property taxes of the undocumented immigration population:

Sales and excise taxes: Sales and excise taxes are collected by retailers every time a purchase is made on a taxable good or service. It is reasonable to assume that DACA eligible immigrants pay sales and excise taxes at similar rates to U.S. citizens and legal immigrants with similar incomes thus the estimated rates in ITEP's *Who Pays?* for each state were applied to the various estimated DACA-eligible population incomes.

Income tax: Eligible immigrants enrolled in DACA are required to pay personal income taxes using a temporary social security number. Thus, this study assumes the 740,400 DACA-enrolled workers are fully complying with state personal income taxes. 100 percent compliance is also assumed under the path to citizenship policy option. Personal income tax effective rates in each state were applied accordingly.

Various studies have estimated between 50 and 75 percent of undocumented immigrants currently pay personal income taxes predominantly using Individual Tax Identification (ITIN) numbers or with false social security numbers.^[xiv] This analysis assumes a 50 percent compliance rate for DACA-eligible immigrants who are not enrolled and applies 50 percent compliance if DACA protections are lost. Personal income tax effective rates in each state were applied to 50 percent of the estimated income.

Enrolled DACA recipients are eligible to receive the federal Earned Income Tax Credit (EITC) and the state versions of the credit as well, however state EITC benefits were not included in this study for two reasons: 1) all DACA-eligible workers are treated as single taxpaying units and 2) the average income of the enrolled DACA population is above the EITC income eligibility amounts for single workers. The impact of state EITCs was also left out of the other policy options given that DACA-eligible immigrants not enrolled in the program are ineligible for the credit.

Property tax: The first step in calculating property taxes was to identify the share of DACA-eligible immigrants who are homeowners or renters in each state. This analysis used state-by-state data from the Migration Policy Institute to estimate homeownership rates for undocumented immigrants in each state. The model assumes that for renters, half of the cost of the property tax paid initially by owners of rental properties is passed through to renters.

Appendix 1: State and Local Tax Contributions of DACA-eligible individuals*Current and potential contributions of those currently receiving or eligible for DACA status*

State	Current State and Local Taxes	Current Effective Tax Rate	Taxes if All Eligible Receiving	Change if All Eligible are Receiving	New Effective Tax Rate	Taxes if All Eligible Granted Citizenship	Change if All Eligible Granted Citizenship	New Effective Tax Rate ²	Taxes if DACA Protections Lost	Change if DACA Protections are Lost	New Effective Tax Rate ³
Alabama	\$13,220,000	9.0%	\$17,605,000	+\$4,385,000	9.4%	\$18,172,000	+\$4,952,000	9.4%	\$8,376,000	-\$4,844,000	8.2%
Alaska*	\$966,000	4.0%	\$1,659,000	+\$693,000	4.0%	\$1,712,000	+\$746,000	4.0%	\$903,000	-\$63,000	4.0%
Arizona	\$61,357,000	9.0%	\$65,837,000	+\$4,480,000	9.1%	\$67,961,000	+\$6,604,000	9.1%	\$33,274,000	-\$28,083,000	8.4%
Arkansas	\$15,894,000	11.1%	\$18,821,000	+\$2,927,000	11.3%	\$19,428,000	+\$3,534,000	11.3%	\$9,336,000	-\$6,558,000	10.3%
California	\$534,124,000	8.2%	\$652,389,000	+\$118,265,000	8.3%	\$673,433,000	+\$139,309,000	8.3%	\$334,630,000	-\$199,494,000	7.8%
Colorado	\$33,977,000	7.8%	\$37,631,000	+\$3,654,000	7.9%	\$38,845,000	+\$4,868,000	7.9%	\$17,479,000	-\$16,498,000	6.7%
Connecticut	\$17,639,000	10.0%	\$23,269,000	+\$5,630,000	10.2%	\$24,019,000	+\$6,380,000	10.2%	\$12,144,000	-\$5,495,000	9.8%
Delaware	\$2,434,000	5.0%	\$3,377,000	+\$943,000	5.4%	\$3,486,000	+\$1,052,000	5.4%	\$1,410,000	-\$1,024,000	4.2%
District of Columbia*	\$2,702,000	8.7%	\$3,910,000	+\$1,208,000	9.4%	\$4,036,000	+\$1,334,000	9.4%	\$1,756,000	-\$946,000	7.8%
Florida	\$100,239,000	8.5%	\$127,799,000	+\$27,560,000	8.5%	\$131,922,000	+\$31,683,000	8.5%	\$69,534,000	-\$30,705,000	8.5%
Georgia	\$71,705,000	9.0%	\$90,911,000	+\$19,206,000	9.3%	\$93,844,000	+\$22,139,000	9.3%	\$43,172,000	-\$28,533,000	8.1%
Hawaii	\$3,223,000	11.2%	\$4,978,000	+\$1,755,000	12.0%	\$5,138,000	+\$1,915,000	12.0%	\$2,353,000	-\$870,000	10.4%
Idaho	\$6,026,000	7.9%	\$6,578,000	+\$552,000	7.9%	\$6,791,000	+\$765,000	7.9%	\$3,288,000	-\$2,738,000	7.3%
Illinois	\$131,028,000	11.0%	\$159,279,000	+\$28,251,000	11.3%	\$164,417,000	+\$33,389,000	11.3%	\$76,260,000	-\$54,768,000	9.9%
Indiana	\$23,288,000	10.4%	\$23,784,000	+\$496,000	10.4%	\$24,552,000	+\$1,264,000	10.4%	\$10,755,000	-\$12,533,000	8.7%
Iowa	\$6,807,000	9.2%	\$7,806,000	+\$999,000	9.4%	\$8,058,000	+\$1,251,000	9.4%	\$3,594,000	-\$3,213,000	8.0%
Kansas	\$14,592,000	9.2%	\$15,361,000	+\$769,000	9.2%	\$15,856,000	+\$1,264,000	9.2%	\$7,699,000	-\$6,893,000	8.5%
Kentucky	\$9,093,000	9.1%	\$12,116,000	+\$3,023,000	9.7%	\$12,507,000	+\$3,414,000	9.7%	\$5,182,000	-\$3,911,000	7.6%
Louisiana	\$7,459,000	9.5%	\$10,221,000	+\$2,762,000	9.8%	\$10,551,000	+\$3,092,000	9.8%	\$5,061,000	-\$2,398,000	9.0%
Maine*	\$256,000	7.7%	\$330,000	+\$74,000	8.0%	\$341,000	+\$85,000	8.0%	\$160,000	-\$96,000	7.1%
Maryland	\$40,801,000	10.8%	\$56,926,000	+\$16,125,000	11.4%	\$58,762,000	+\$17,961,000	11.4%	\$26,907,000	-\$13,894,000	9.9%
Massachusetts	\$24,261,000	8.1%	\$34,426,000	+\$10,165,000	8.7%	\$35,537,000	+\$11,276,000	8.7%	\$15,052,000	-\$9,209,000	7.0%
Michigan	\$15,938,000	8.9%	\$18,952,000	+\$3,014,000	9.1%	\$19,563,000	+\$3,625,000	9.1%	\$8,666,000	-\$7,272,000	7.7%

Appendix 1: State and Local Tax Contributions of DACA-eligible individuals*Current and potential contributions of those currently receiving or eligible for DACA status*

State	Current State and Local Taxes	Current Effective Tax Rate	Taxes if All Eligible Receiving	Change if All Eligible are Receiving	New Effective Tax Rate	Taxes if All Eligible Granted Citizenship	Change if All Eligible Granted Citizenship	New Effective Tax Rate ²	Taxes if DACA Protections Lost	Change if DACA Protections are Lost	New Effective Tax Rate ³
Minnesota	\$15,439,000	8.7%	\$18,766,000	+\$3,327,000	9.0%	\$19,372,000	+\$3,933,000	9.0%	\$8,550,000	-\$6,889,000	7.6%
Mississippi	\$4,169,000	8.4%	\$5,442,000	+\$1,273,000	8.7%	\$5,618,000	+\$1,449,000	8.7%	\$2,593,000	-\$1,576,000	7.6%
Missouri	\$8,430,000	8.1%	\$10,513,000	+\$2,083,000	8.4%	\$10,852,000	+\$2,422,000	8.4%	\$4,916,000	-\$3,514,000	7.2%
Montana*	\$101,000	5.3%	\$112,000	+\$11,000	5.4%	\$116,000	+\$15,000	5.4%	\$50,000	-\$51,000	4.4%
Nebraska	\$7,693,000	9.6%	\$8,013,000	+\$320,000	9.6%	\$8,272,000	+\$579,000	9.6%	\$3,905,000	-\$3,788,000	8.6%
Nevada	\$17,488,000	5.6%	\$18,595,000	+\$1,107,000	5.6%	\$19,195,000	+\$1,707,000	5.6%	\$10,117,000	-\$7,371,000	5.6%
New Hampshire*	\$812,000	7.6%	\$946,000	+\$134,000	7.6%	\$976,000	+\$164,000	7.6%	\$512,000	-\$300,000	7.5%
New Jersey	\$65,968,000	7.9%	\$90,221,000	+\$24,253,000	8.2%	\$93,131,000	+\$27,163,000	8.2%	\$44,911,000	-\$21,057,000	7.5%
New Mexico	\$18,848,000	10.3%	\$21,646,000	+\$2,798,000	10.4%	\$22,345,000	+\$3,497,000	10.4%	\$11,288,000	-\$7,560,000	10.0%
New York	\$140,035,000	10.7%	\$174,199,000	+\$34,164,000	11.0%	\$179,818,000	+\$39,783,000	11.0%	\$84,137,000	-\$55,898,000	9.8%
North Carolina	\$63,618,000	8.6%	\$75,296,000	+\$11,678,000	8.8%	\$77,725,000	+\$14,107,000	8.8%	\$34,532,000	-\$29,086,000	7.5%
North Dakota	\$286,000	8.6%	\$360,000	+\$74,000	8.7%	\$371,000	+\$85,000	8.7%	\$190,000	-\$96,000	8.4%
Ohio	\$14,103,000	9.4%	\$18,397,000	+\$4,294,000	9.8%	\$18,991,000	+\$4,888,000	9.8%	\$8,586,000	-\$5,517,000	8.4%
Oklahoma	\$17,411,000	9.5%	\$20,064,000	+\$2,653,000	9.7%	\$20,711,000	+\$3,300,000	9.7%	\$9,950,000	-\$7,461,000	8.8%
Oregon	\$20,021,000	7.1%	\$22,898,000	+\$2,877,000	7.3%	\$23,637,000	+\$3,616,000	7.3%	\$8,995,000	-\$11,026,000	5.3%
Pennsylvania	\$20,765,000	8.9%	\$30,086,000	+\$9,321,000	9.7%	\$31,056,000	+\$10,291,000	9.7%	\$13,239,000	-\$7,526,000	7.8%
Rhode Island	\$3,842,000	8.2%	\$5,300,000	+\$1,458,000	8.5%	\$5,471,000	+\$1,629,000	8.5%	\$2,602,000	-\$1,240,000	7.7%
South Carolina	\$11,768,000	6.5%	\$13,835,000	+\$2,067,000	6.7%	\$14,281,000	+\$2,513,000	6.7%	\$6,802,000	-\$4,966,000	6.0%
South Dakota*	\$585,000	8.1%	\$672,000	+\$87,000	8.1%	\$693,000	+\$108,000	8.1%	\$365,000	-\$220,000	8.1%
Tennessee	\$21,266,000	8.7%	\$25,228,000	+\$3,962,000	8.7%	\$26,042,000	+\$4,776,000	8.7%	\$13,723,000	-\$7,543,000	8.7%
Texas	\$313,095,000	9.5%	\$347,623,000	+\$34,528,000	9.5%	\$358,837,000	+\$45,742,000	9.5%	\$189,137,000	-\$123,958,000	9.5%
Utah	\$18,807,000	8.4%	\$19,372,000	+\$565,000	8.5%	\$19,997,000	+\$1,190,000	8.5%	\$8,981,000	-\$9,826,000	7.2%
Vermont*	\$140,000	8.6%	\$185,000	+\$45,000	8.9%	\$191,000	+\$51,000	8.9%	\$92,000	-\$48,000	8.2%

Appendix 1: State and Local Tax Contributions of DACA-eligible individuals*Current and potential contributions of those currently receiving or eligible for DACA status*

State	Current State and Local Taxes	Current Effective Tax Rate	Taxes if All Eligible Receiving	Change if All Eligible are Receiving	New Effective Tax Rate	Taxes if All Eligible Granted Citizenship	Change if All Eligible Granted Citizenship	New Effective Tax Rate ²	Taxes if DACA Protections Lost	Change if DACA Protections are Lost	New Effective Tax Rate ³
Virginia	\$34,726,000	7.4%	\$50,323,000	+\$15,597,000	8.1%	\$51,946,000	+\$17,220,000	8.1%	\$22,019,000	-\$12,707,000	6.5%
Washington	\$51,272,000	10.5%	\$59,072,000	+\$7,800,000	10.5%	\$60,978,000	+\$9,706,000	10.5%	\$32,140,000	-\$19,132,000	10.5%
West Virginia*	\$283,000	8.0%	\$342,000	+\$59,000	8.2%	\$353,000	+\$70,000	8.2%	\$161,000	-\$122,000	7.1%
Wisconsin	\$17,825,000	9.4%	\$19,926,000	+\$2,101,000	9.6%	\$20,569,000	+\$2,744,000	9.6%	\$9,365,000	-\$8,460,000	8.3%
Wyoming*	\$949,000	5.3%	\$1,217,000	+\$268,000	5.3%	\$1,256,000	+\$307,000	5.3%	\$662,000	-\$287,000	5.3%
All States	\$2,026,772,000	8.9%	\$2,452,614,000	+\$425,842,000	9.0%	\$2,531,730,000	+\$504,958,000	9.0%	\$1,229,516,000	-\$797,256,000	8.3%

Appendix 2: DACA Eligible Population Estimates

STATE	Estimated Population Immediately Eligible for DACA ¹	Estimated Population Enrolled in DACA ²	Estimated Population Eligible for DACA but not Enrolled	Share of Est. Undocumented Immigrant Population ³
Alabama	9,000	4,720	4,280	13%
Alaska*	2,000	170	1,830	29%
Arizona	35,000	30,180	4,820	14%
Arkansas	8,000	5,530	2,470	14%
California	379,000	237,940	141,060	13%
Colorado	23,000	18,830	4,170	14%
Connecticut	11,000	5,430	5,570	10%
Delaware	3,000	1,560	1,440	13%
Dist. of Col.*	2,000	880	1,120	7%
Florida	72,000	37,940	34,060	12%
Georgia	47,000	28,090	18,910	12%
Hawaii	2,000	660	1,340	10%
Idaho	4,000	3,330	670	12%
Illinois	68,000	44,860	23,140	13%
Indiana	11,000	10,580	420	12%
Iowa	4,000	3,050	950	11%
Kansas	8,000	7,200	800	13%
Kentucky	6,000	3,380	2,620	13%
Louisiana	5,000	2,320	2,680	8%
Maine*	200	110	90	4%

Maryland	24,000	11,110	12,890	9%
Massachusetts	19,000	9,030	9,970	11%
Michigan	10,000	7,070	2,930	10%
Minnesota	10,000	6,740	3,260	12%
Mississippi	3,000	1,660	1,340	12%
Missouri	6,000	3,770	2,230	11%
Montana*	100	80	20	10%
Nebraska	4,000	3,690	310	11%
Nevada	16,000	13,910	2,090	12%
New Hampshire*	600	420	190	7%
New Jersey	53,000	24,630	28,370	11%
New Mexico	10,000	7,300	2,700	15%
New York	76,000	47,170	28,830	9%
North Carolina	41,000	29,260	11,750	12%
North Dakota	200	110	90	7%
Ohio	9,000	5,060	3,940	11%
Oklahoma	10,000	7,380	2,620	12%
Oregon	15,000	11,900	3,100	13%
Pennsylvania	15,000	6,700	8,300	11%
Rhode Island	3,000	1,380	1,620	10%
South Carolina	10,000	7,060	2,940	10%
South Dakota*	400	290	110	8%

Tennessee	14,000	9,180	4,820	12%
Texas	177,000	138,440	38,560	12%
Utah	11,000	10,400	600	14%
Vermont*	100	50	50	3%
Virginia	30,000	13,470	16,530	11%
Washington	27,000	19,180	7,820	12%
West Virginia*	200	140	70	3%
Wisconsin	10,000	8,010	1,990	14%
Wyoming*	1,000	690	310	17%
All States	1,304,800	852,000	452,900	12%

* DACA eligible population in these states was estimated using data on enrolled DACA participants as of September 2016. Nationwide roughly 66 percent of immigrants immediately eligible DACA are enrolled thus the assumption was made that the actual participants in those states represent 66 percent of the eligible population (rounding was used).

¹ Batalova, Jeanne, et al. "DACA at the Two-Year Mark: A National and State Profile of Youth Eligible and Applying for Deferred Action." Migration Policy Institute, Aug. 2014, <http://www.migrationpolicy.org/research/daca-two-year-mark-national-and-state-profile-youth-eligible-and-applying-deferred-action>

² "Deferred Action for Childhood Arrivals Process (Through Fiscal Year 2016, 4th Qtr)." United States Citizenship and Immigration Services (USCIS). Available at: https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/All%20Form%20Types/DACA/daca_performancedata_fy2016_qtr4.pdf

³ Migration Policy Institute (MPI) DACA estimates divided by MPI undocumented immigrant population estimates (Migration Policy Institute (MPI) analysis of U.S. Census Bureau data from the 2010-2014 ACS pooled, and the 2008 Survey of Income and Program Participation (SIPP) by Colin Hammar and James Bachmeier of Temple University and Jennifer Van Hook of Pennsylvania State University, Population Research Institute.)

[i] "Deferred Action for Childhood Arrivals Process (Through Fiscal Year 2016, 4th Qtr.)." United States Citizenship and Immigration Services (USCIS). Available at: https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/All%20Form%20Types/DACA/daca_performancedata_fy2016_qtr4.pdf

(https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/All%20Form%20Types/DACA/daca_performancedata_fy2016_qtr4.pdf)

[ii] Batalova, Jeanne, et al. "DACA at the Two-Year Mark: A National and State Profile of Youth Eligible and Applying for Deferred Action." Migration Policy Institute, Aug. 2014, <http://www.migrationpolicy.org/research/daca-two-year-mark-national-and-state-profile-youth-eligible-and-applying-deferred-action>

[iii] Christensen Gee, et al. "Undocumented Immigrants' State and Local Tax Contributions." Institute on Taxation and Economic Policy, Mar. 2017, <http://www.itiep.org/pdf/Immigration2017.pdf> (<http://www.itiep.org/pdf/Immigration2017.pdf>)

[iv] See the methodology section for more information on the calculation of estimated undocumented immigrant state and local tax payments.

[v] Davis, Carl, et al. "Who Pays? A Distributional Analysis of the Tax Systems in All 50 States, 5th ed.," Institute on Taxation and Economic Policy, Jan. 2015, www.whopays.org (<http://www.whopays.org>).

[vi] "Results of Tom K. Wong, United We Dream, National Immigration Law Center, and Center for American Progress National Survey." Center for American Progress, https://cdn.americanprogressaction.org/content/uploads/2016/10/2111136/2016-daca_survey_draft_updated-FINAL2.pdf (https://cdn.americanprogressaction.org/content/uploads/2016/10/2111136/2016-daca_survey_draft_updated-FINAL2.pdf)

[vii] "Economic Impact of S. 744, Border Security, Economic Opportunity, and Immigration Modernization Act." *Congressional Budget Office*, Congressional Budget Office, Jun. 2013, www.cbo.gov/sites/default/files/113th-congress-2013-2014/reports/44346-Immigration.pdf.

[viii] See endnote 2 and Migration Policy Institute, "Deferred Action for Childhood Arrivals (DACA) Data Tools." <http://www.migrationpolicy.org/programs/data-hub/deferred-action-childhood-arrivals-daca-profiles#overlay-context=events> (<http://www.migrationpolicy.org/programs/data-hub/deferred-action-childhood-arrivals-daca-profiles#overlay-context=events>)

[ix] USCIS (see endnote i)

[x] Center for American Progress (see endnote vi)

[xi] Oakford, Patrick. "Administrative Action on Immigration Reform." Center for American Program, September 2014. <https://www.americanprogress.org/issues/immigration/reports/2014/09/04/96177/administrative-action-on-immigration-reform/>

[xii] Congressional Budget Office (see endnote vii)

[xiii] Institute on Taxation and Economic Policy (see endnote iii)

[xiv] See among others: Feinleib, Joel, and David Warner. "Issue Brief #1: The Impact of Immigration on Social Security and the National Economy." *Social Security Advisory Board*, Social Security Advisory Board, Dec. 2005, www.ssab.gov/Portals/0/OUR_WORK/REPORTS/Impact%20of%20Immigration%20on%20Social%20Security%20Brief_2005.pdf (http://www.ssab.gov/Portals/0/OUR_WORK/REPORTS/Impact%20of%20Immigration%20on%20Social%20Security%20Brief_2005.pdf); Singer, Paula, and Linda Dodd-Major. "Identification Numbers and U.S. Government Compliance Initiatives." *Tax Analysts*, 20 Sept, 2004; and Cornelius, Wayne, and Jessica Lewis. *Impacts of Border Enforcement on Mexican Migration: The View from Sending Communities*, La Jolla, Calif.: University of California at San Diego, Center for Comparative Immigration Studies, 2007. 2017 State and Local Tax Contributions of Young Undocumented Immigrants.pdf (http://itep.org/itep_reports/pdf/2017%20State%20and%20Local%20Tax%20Contributions%20of%20Young%20Undocumented%20Immigrants.pdf)

Tags

IMMIGRATION AND TAXES ([HTTPS://ITEP.ORG/TAG/IMMIGRATION/](https://itep.org/tag/immigration/))

Share

subject=From%20ITEP&body=I%20found%20something%20interesting%20from%20the%20Institute%20on%20Taxation%20and%20Economic%20Policy%3A%20%20local-tax-contributions-of-young-undocurr

f ([http://www.facebook.com/sharer/sharer.php?u=https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants/&title=State & Local Tax Contributions of Young Undocumented Immigrants \(2017\)](http://www.facebook.com/sharer/sharer.php?u=https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants/&title=State%20&Local%20Tax%20Contributions%20of%20Young%20Undocumented%20Immigrants%20(2017)))

t (<http://twitter.com/intent/tweet?status=https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants/%20@iteptweets>)

in ([https://www.linkedin.com/shareArticle?mini=true&url=https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants/&summary=This%20report%20specifically%20examines%20the%20state%20and%20local%20tax%20contributions%20of%20undocumented%20immigrants](https://www.linkedin.com/shareArticle?mini=true&url=https://itep.org/state-local-tax-contributions-of-young-undocumented-immigrants/&summary=This%20report%20specifically%20examines%20the%20state%20and%20local%20tax%20contributions%20of%20undocumented%20immigrants%20(2017)) (2017)&summary=This%20report%20specifically%20examines%20the%20state%20and%20local%20tax%20contributions%20of%20undocumented%20immigrants

Related Content

State & Local Tax Contributions of Young Undocumented Immigrants (state-local-tax-contributions-of-young-undocumented-immigrants-2)

Read as PDF (Includes Appendices of State-by-State Data) Introduction The Trump administration's immigration policies have broken apart families and removed...

REPORT (/category/reports)

Updated Tax Contributions of Young Undocumented Immigrants (updated-tax-contributions-of-young-undocumented-immigrants)

In September 2017, US Citizenship and Immigration Services released updated enrollment data for the program Deferred Action for Childhood Arrivals...

[REPORT](#) (/category/reports)

State and Local Tax Contributions of Undocumented Californians: County-by- County Data (state-and-local-tax-contributions-of-undocumented-californians-county-by-county-data)

Read the Report in PDF. Public debates in California over immigrants, specifically around undocumented immigrants, often suffer from insufficient and...

[REPORT](#) (/category/reports)

ITEP

Washington, DC Office
1616 P Street, NW Suite 200
Washington, DC 20036
Phone: 202-299-1066
Fax: 202-299-1065
e-mail: itep@itep.org

North Carolina Office
307 W. Main Street, 106
Durham, NC 27701
Phone: 919-381-5918



(<https://www.facebook.com/instituteontaxation>)



(<https://twitter.com/iteptweets>)

WordPress Website Development by Adapter, Washington DC (<https://technotarek.com>)

EXHIBIT 10



An Estimated 123,000 'Dreamers' Own Homes and Pay \$380M in Property Taxes

By Alexander Casey (<https://www.zillow.com/research/about-us/alexander-casey/>) on Sep. 20, 2017

- An estimated 123,000 people bought homes after their DACA applications were approved.
- They pay an estimated \$380 million a year in property taxes to their communities.
- California and Texas Dreamer homeowners pay enough in property taxes to fund the salaries of more than 1,500 elementary school teachers in each state for a year.

Tens of thousands of "Dreamers" own homes nationwide—and they pay hundreds of millions of dollars in property taxes every year.

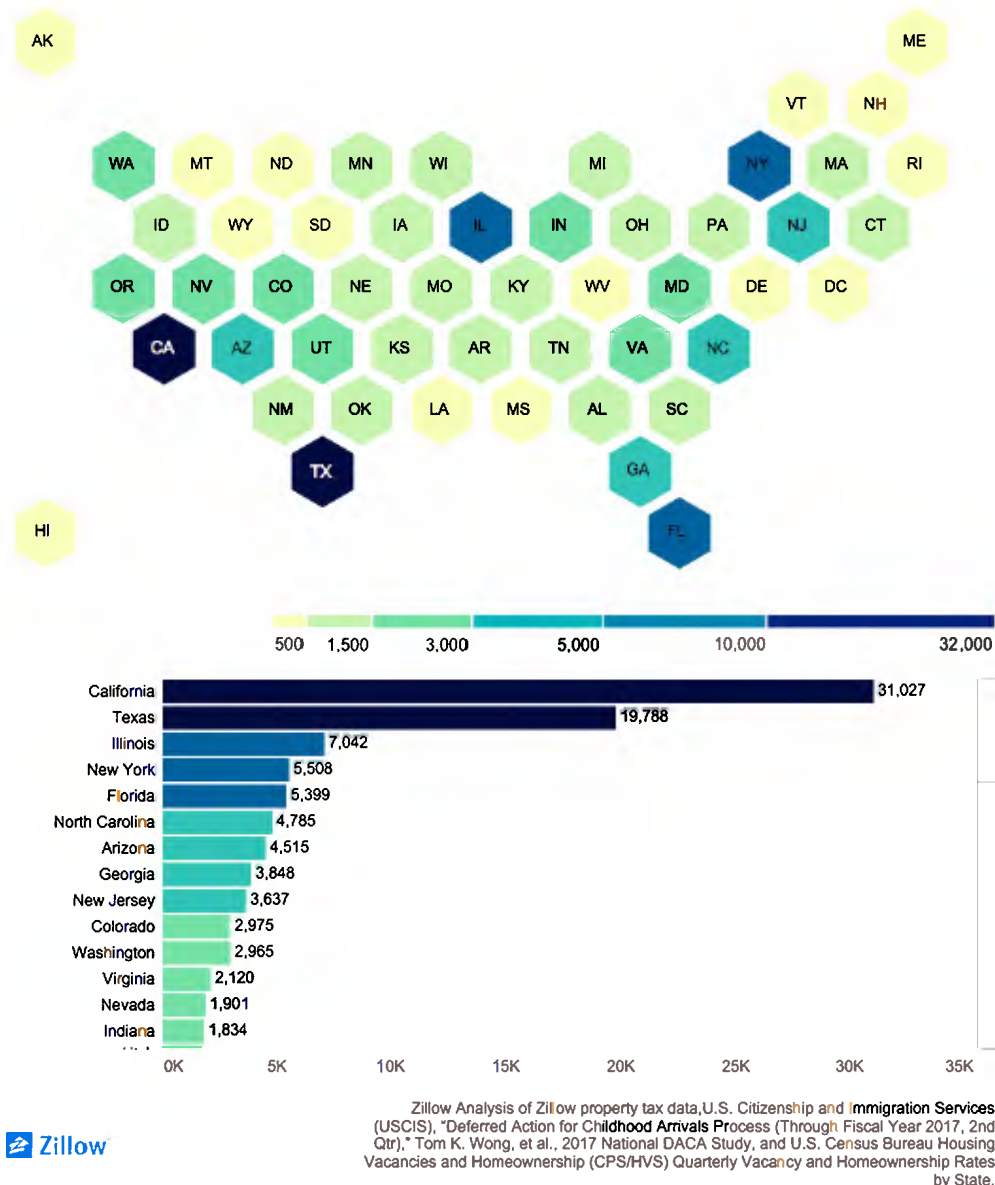
While these young, undocumented immigrants scramble to adjust as the federal government considers a phaseout of its Deferred Action for Childhood Arrivals (DACA) program, they must consider the homes they purchased while under DACA protection from deportation.

Using DACA recipient and property tax data, we estimate that across the nation, 123,000 of the country's nearly 800,000 Dreamers—undocumented immigrants who were brought to the United States as children and are now mostly in their 20s—are homeowners. [i] They pay roughly \$380 million in property taxes to their communities, which can fund things like schools, firefighters, roads and bridges.

In California and Texas, where DACA recipients are most likely to live, an estimated \$111 million and \$81 million, respectively, in property taxes each year come from homes owned by Dreamers. That's enough to cover the annual salaries of roughly 1,500 elementary school teachers in each of those states—a useful comparison as schools often rely on property taxes for funding. [ii]

Dreamer Homeowners

An estimated 123,000 Dreamers own homes nationwide.



These estimates don't include contributions from Dreamer renters, who also pay property taxes as a portion of their monthly rent checks; the precise tax burden split between tenants and property owners can be difficult to determine.

Given the more than 75 million total owner occupied units (https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_B25003&prodType=table) in the United States, and the tens of billions in property taxes collected each year from Californians alone, these aren't exceptionally large numbers relative to the general population. And while a place like San Francisco, for instance, certainly doesn't rely solely on property taxes from DACA recipients to keep the trains running on time, Dreamers do in fact contribute hundreds of millions of dollars to local governments when they buy, rent, work and shop.

Dreamer Property Taxes

Dreamer homeowners pay an estimated \$380M in property taxes each year.

1M in property taxes each year.

nd
ap.



About Tableau
Share
Download

According to the Migration Policy Institute (<http://www.migrationpolicy.org/programs/data-hub/deferred-action-childhood-arrivals-daca-profiles>), an estimated 1.9 million DACA-eligible individuals reside in the United States.

If DACA protections were extended to the entire eligible population and the homeownership rate among those with DACA approval remained constant, the United States would have roughly 300,000 total homeowners thanks to DACA. That would mean more than \$945 million each year in property taxes alone from Dreamer homeowners to communities across the map. As people with DACA approval age, we could expect the homeownership rate and tax contribution to rise, given survey data (<https://cdn.americanprogress.org/content/uploads/2017/08/27164928/Wong-Et-Al-New-DACA-Survey-2017-Codebook.pdf>) that show higher homeownership rates among older DACA recipients.

Methodology

We used the number of approved DACA applications (https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/All%20Form%20Types/DACA/daca_performance_data_fy2017_qtr2.pdf) in each state from U.S. Citizen and Immigration Services as of March 2017 (most current available). A 2017 survey (<https://cdn.americanprogress.org/content/uploads/2017/08/27164928/Wong-Et-Al-New-DACA-Survey-2017-Codebook.pdf>) of more than 3,000 DACA recipients found almost one in six respondents purchased a home after their DACA application was approved. We reweighted the distribution of our estimated total DACA homeowners across the country based on each state's overall homeownership rate.

(<https://www.census.gov/housing/hvs/data/rates.html>) relative to the national homeownership rate. That way, we assume a DACA recipient homeownership rate proportionally lower than 15.7 percent (national estimate from survey) in states with a lower overall homeownership rate—and a higher DACA homeownership rate in states where the general population is more likely to own. With our weighted estimates of DACA homeowners in each state, we multiplied DACA homeowners by the median property tax paid in each state. To compute medians, we used the most recent property tax data available for all single-family homes and condominiums among properties transacted since 2012—the earliest year that a Dreamer could have purchased a home post-DACA.

Due to limited data on where exactly Dreamers bought homes, the value of homes purchased, and how instrumental DACA acceptance was to their purchase, our estimates could vary significantly using different assumptions. We assumed the overall homeownership patterns in their state of residence impact a Dreamer's likelihood of purchasing a home. If that assumption doesn't hold, however, there may be different numbers of DACA homeowners in particular states, which would alter the tax totals. Because we have no indication of the value of the homes owned by Dreamers, we assumed they paid the median property tax for their state among properties transacted or built since 2012. If DACA recipients bought homes assessed lower than the median, which is possible given their young age, the amount of taxes paid each year would be lower. Also, property taxes can vary wildly within states, and without knowing the precise jurisdictions where Dreamers bought or are concentrated within a state, the property tax totals could vary significantly from state medians. Furthermore, our assumption of the homeownership rate of DACA recipients relies on survey data that don't account for homes owned by Dreamers prior to receiving DACA authorization. Finally, if those surveyed do not in fact accurately represent the true population of Dreamers, the estimated number of Dreamer homeowners across the country could be inaccurate.

[i] Calculated using cumulative approved initial totals from USCIS

(https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/All%20Form%20Types/DACA/daca_performeddata_fy2017_qtr2.pdf), which include applicants from US territories and applications not indicating a State. We did not include US territories or those in unknown geographies in the estimation of property tax contributions.

[ii] Assuming state median wages (<https://data.bls.gov/oes/#/occGeo/One%20occupation%20for%20multiple%20geographical%20areas>).



(<http://www.sagepub.com/journalsPermissions.nav>)

u=<http://www.bilibili.com/video/av9586250/?fch%2Fda>

Share: [home](#) [news](#) [servers](#) -

3803m-3803m-3803m-3803m-

taxtaxtaxtaxes-

1661256281587281%2F&title=Estimate1231e2G005%2000e&f%275D2e&0x

Related Tags

DACA (<https://www.zillow.com/research/tag/daca/>)

Dreamers (<https://www.zillow.com/research/tag/dreamers/>)

Immigrants (<https://www.zillow.com/research/tag/immigrants/>)

property taxes (<https://www.zillow.com/research/tag/property-taxes/>)

Most Popular

Birth Rates Dropped Most in Counties Where Home Values Grew Most

(<https://www.zillow.com/research/birth-rates-home-values-20165/>)

Mortgage Rates Erase Half Their Gains Since Mid-January (<https://www.zillow.com/research/mortgage-rates-erase-half-their-gains-since-mid-january/>)

rates-18722/)

Home Values Climbing at Fastest Rate in 12 Years (April 2018 Market Report)

(<https://www.zillow.com/research/april-2018-market-report-20030/>)

Home Values Remain Low in Vast Majority of Formerly Redlined Neighborhoods

(<https://www.zillow.com/research/home-values-redlined-areas-19674/>)

Related

POLICY/POLITICS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/POLICY-POLITICS/](https://www.zillow.com/research/policy-politics/)) / STORY

Experts: Housing Not Immune to... (<https://www.zillow.com/research/housing-costs-and-immigration-11784/>) Experts: Housing Not Immune to... (<https://www.zillow.com/research/housing-costs-and-immigration-11784/>)

BY CORY HOPKINS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/ABOUT-US/CORY-HOPKINS/](https://www.zillow.com/research/about-us/cory-hopkins/)) ON FEB. 17, 2016
So far in the 2016 presidential campaign,...

BUYING/SELLING ([HTTPS://WWW.ZILLOW.COM/RESEARCH/BUYING-SELLING/](https://www.zillow.com/research/buying-selling/)) - POLICY/POLITICS
([HTTPS://WWW.ZILLOW.COM/RESEARCH/POLICY-POLITICS/](https://www.zillow.com/research/policy-politics/)) / STORY

After Georgia's Strict 2011... (<https://www.zillow.com/research/georgia-immigration-law-home-prices-14952/>) After Georgia's Strict 2011... (<https://www.zillow.com/research/georgia-immigration-law-home-prices-14952/>)

BY AARON TERRAZAS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/ABOUT-US/AARON-TERRAZAS/](https://www.zillow.com/research/about-us/aaron-terrazas/)) ON APR. 24, 2017
After Georgia enacted a law to crack down on...

BUYING/SELLING ([HTTPS://WWW.ZILLOW.COM/RESEARCH/BUYING-SELLING/](https://www.zillow.com/research/buying-selling/)) - NEWS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/NEWS/](https://www.zillow.com/research/news/)) / STORY

Mortgage Rates Erase Half Their Gains... (<https://www.zillow.com/research/mortgage-rates-18722/>)
Mortgage Rates Erase Half Their Gains... (<https://www.zillow.com/research/mortgage-rates-18722/>)

BY AARON TERRAZAS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/ABOUT-US/AARON-TERRAZAS/](https://www.zillow.com/research/about-us/aaron-terrazas/)) ON JUL. 18, 2018
Escalating trade woes and weak housing...

BUYING/SELLING ([HTTPS://WWW.ZILLOW.COM/RESEARCH/BUYING-SELLING/](https://www.zillow.com/research/buying-selling/)) / STORY

Home Sales Forecast: June 2018 (<https://www.zillow.com/research/home-sales-forecast-june-2018-20734/>) Home Sales Forecast: June 2018 (<https://www.zillow.com/research/home-sales-forecast-june-2018-20734/>)

BY AARON TERRAZAS ([HTTPS://WWW.ZILLOW.COM/RESEARCH/ABOUT-US/AARON-TERRAZAS/](https://www.zillow.com/research/about-us/aaron-terrazas/)) ON JUL. 18, 2018
We expect the sluggishness in existing home...

About Us (<https://www.zillow.com/research/about-us/>)

Contact Us (<https://www.zillow.com/research/contact-us/>)

Join our conversation

Sign up for our mailing list and receive the latest reports

ABOUT ([HTTPS://WWW.ZILLOW.COM/CORP/ABOUT.HTM](https://www.zillow.com/corp/about.htm)) **ZESTIMATES** ([HTTPS://WWW.ZILLOW.COM/ZESTIMATE/](https://www.zillow.com/zestimate/))

JOBS ([HTTPS://WWW.ZILLOW.COM/JOBS/](https://www.zillow.com/jobs/)) **HELP** ([HTTPS://WWW.ZILLOW.COM/HELP/](https://www.zillow.com/help/)) **ADVERTISE** ([HTTPS://WWW.ZILLOW.COM/ADVERTISING/](https://www.zillow.com/advertising/))

TERMS OF USE & PRIVACY ([HTTPS://WWW.ZILLOW.COM/CORP/TERMS.HTM](https://www.zillow.com/corp/terms.htm))

AD CHOICE ([HTTPS://WWW.ZILLOW.COM/CORP/PRIVACY.HTM#BEHAVIORALADVERTISING](https://www.zillow.com/corp/privacy.htm#behavioraladvertising)) **BLOG** ([HTTPS://WWW.ZILLOW.COM/BLOG/](https://www.zillow.com/blog/))

MOBILE APPS ([HTTPS://WWW.ZILLOW.COM/MOBILE/](https://www.zillow.com/mobile/))



© 2006-2018 Zillow Group or its companies

Follow Us (<https://www.zillow.com/company/zillow/>)

EXHIBIT 11

Consumer Spending and U.S. Growth

Consumer spending: an engine for U.S. job growth

Personal consumption expenditures continue to account for more than 60 percent of total employment in the U.S. economy, with consumers increasingly shifting their purchases to a sophisticated array of personal services

Mitra Toossi

Consumer decisions about what to buy, how much to buy, and when to buy from the myriad of goods and services that are available today not only satisfy their own needs, but also determine how much of which goods and services ultimately will be produced. The production of these goods and services creates jobs in all sectors of the economy. Some of the jobs that are created are the direct result of production in industries that produce goods and services to meet consumer demands (final goods), and the rest are generated in industries that provide inputs for the production of final goods and services (intermediate goods). Whether employment is generated in the final-goods industries or in related intermediate industries, it originates from consumer choices and reflects the wishes of those consumers. Each component of gross domestic product (GDP), which consists of personal consumption expenditures, investments, exports, and government expenditures, contributes in varying degrees to the level and distribution of output and employment. Personal consumption expenditures, accounting for the largest share of GDP, are the main generator of employment in the economy.¹

In 2000, employment generated by consumer spending was 83.2 million, accounting for 62 percent of total employment in the economy. Consumer spending is projected to add 11.3 million net new jobs by 2010, so that total employment resulting from consumer spending will reach 94.5 million, or 61 percent of all

employment that year. The annual growth rate of employment generated by consumer spending is projected to be 1.3 percent, considerably less than the 1.8-percent growth rate during 1990–2000.

From 2000 to 2010, as in the previous decade, virtually all nonfarm wage and salary employment growth is expected to be in the service-producing sector. Despite continued strong output growth resulting from consumer expenditures for durable goods, the goods-producing sector is, in fact, anticipated to lose employment, because growth in the demand for intermediate and final goods in that sector is concentrated in industries with high productivity increases.

Within the service-producing sector, the services industry is expected to have the highest growth rate, accounting for a net increase of 8.9 million jobs during 2000–10. The next-largest providers of employment are the retail trade and wholesale trade industries, which are projected to add another 2.0 million jobs. These two industry groups combined are projected to generate about 97 percent of the total increase in the nonfarm wage and salary jobs over the projection period.

In addition to providing an estimate of employment related to consumer spending by industry, this article presents estimates of changing occupational demand due to changes in personal consumption expenditures. The growth of various occupations depends primarily on the growth of industries in which those

Mitra Toossi is an economist in the Office of Occupational Statistics and Employment Projections, Bureau of Labor Statistics.
E-mail: Toossi_m@bls.gov

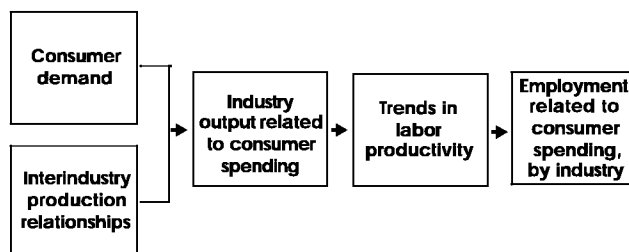
occupations are concentrated. In conformity with past trends, two major occupational groups—professional and related occupations, and service occupations—are projected to be the fastest growing, accounting for about 7.9 million jobs. These two major occupational groups will likely be responsible for more than 70 percent of the total increase in jobs over the 2000–10 period.

Methodology

The main focus of this article is to measure the domestic employment generated by consumer spending on domestically produced goods and services. That aim is part of an effort by the BLS Office of Occupational Statistics and Employment Projections to carry out medium-term economic projections of industrial and occupational employment every 2 years. The projection process involves forecasting GDP (sales to final purchasers), measuring the industrial outputs and employment generated by those sales, and converting the employment figures to occupational estimates through the use of an industry-occupation matrix.² The framework for such an analysis is personal consumption expenditure data from the National Income and Product Accounts and input-output data, both of which are prepared by the Bureau of Economic Analysis.³

The input-output system provides a snapshot of all transactions within the economy at a given point in time—sales of commodities to each industry for further processing (intermediate production) and sales to final users, including consumers, businesses, government, and foreigners (GDP, or final production). By tracing the purchase of a good or service through the entire chain of production, the employment required in each industry to produce that good or service can be measured.

First, a total requirements table is derived from the input-output “use” and “make” tables.⁴ The total requirements table shows the total production required to support a dollar of final demand. The term “total” in this case includes both direct and indirect input requirements to production.⁵ After its generation, the total requirements table is transformed by productivity factors (the employment-output ratio for each industry is used as a proxy for productivity) to convert the production required per dollar of demand to the employment required per dollar of demand. The resulting table, known as an employment requirements table, demonstrates how industry interrelationships in the economy affect employment. The employment requirements tables are import adjusted; that is, they are modified to account only for domestically produced sales of goods and services to final users. The process relating consumer demand to industry output and to the employment that is generated as a result is exhibited in the following diagram:



The trends in labor productivity will dictate whether increases in demand are coincident with decreases or increases in employment and labor requirements.

Industry employment is translated to occupational employment with an industry-occupation matrix that shows the distribution of jobs by occupation within each industry. The information on staffing patterns is developed from the Bureau’s Occupational Employment Statistics survey.⁶ Using the industry-occupation matrix, researchers multiply industry employment by these staffing patterns to generate the occupational employment attributable to consumer spending on domestically produced goods and services.

In the sections that follow, consumption expenditures are discussed both in the aggregate and as a component of GDP. Then industrial outputs are examined in light of consumer demand. Finally, the demand for occupations related to personal consumption expenditure is discussed.

Personal consumption expenditures

During the past three decades, personal consumption expenditures grew rapidly, and its share in GDP increased consistently. (See table 1.) In 1970, as baby boomers became a dominant force in the U.S. economy, consumer spending rose to 64.8 percent of GDP. The share increased to 65.2 percent in 1980 and 66.7 percent in 1990. In the economic expansion of the 1990s, along with rising disposable incomes, consumer spending’s share of the GDP increased further, to 67.8 percent by 2000. The Bureau projects that, by 2010, 68.5 percent of GDP will be accounted for by personal consumption expenditures.

During both the 1980–90 and the 1990–2000 period, consumer spending grew at 3.4 percent each year, 0.2 percent higher than the growth of GDP. The higher growth of personal spending relative to GDP was made possible by a declining savings rate, as well as the wealth effect of an ever-increasing value of stock market assets. BLS projections for the U.S. economy during 2000–10 show growth of 3.5 percent for personal consumption expenditures, 0.1 percentage point higher than the GDP growth rate.⁷

The components of personal consumption expenditures—durable goods, nondurable goods, and services—all enjoyed growth during the past several decades, but at different rates.

Consumer Spending and U.S. Growth

Table 1. Personal consumption expenditures, 1980, 1990, and 2000 (actual) and 2010 (projected)

Category	Billions of chained 1996 dollars				Average annual rate of change (percent)		
	1980	1990	2000	2010	1980-90	1990-2000	2000-10
Gross domestic product	\$4,900.9	\$6,707.9	\$9,224.0	\$12,835.6	3.2	3.2	3.4
Personal consumption expenditures ..	3,193.0	4,474.5	6,257.8	8,786.5	3.4	3.4	3.5
Durable goods	279.8	487.1	895.5	1,455.4	5.7	6.3	5.0
New light vehicles	88.3	159.9	218.6	307.3	6.1	3.2	3.5
Other motor vehicles and parts	54.1	86.2	129.3	176.2	4.8	4.1	3.1
Personal computers .....	.0	1.6	108.8	802.4	(¹)	52.1	22.1
Software .....	.0	.5	17.8	36.3	(¹)	43.7	7.4
Furniture	95.5	160.4	294.6	483.2	5.3	6.3	5.1
Ophthalmic products	6.2	16.1	20.4	27.7	10.1	2.4	3.1
Other durable goods	53.5	80.8	152.9	256.1	4.2	6.6	5.3
Nondurable goods	1,065.8	1,369.6	1,849.9	2,635.5	2.5	3.1	3.6
Food and beverages	585.4	722.4	881.3	1,102.8	2.1	2.0	2.3
Clothing and shoes	124.0	197.2	335.3	511.0	4.7	5.5	4.3
Gasoline and motor oil	94.8	113.1	136.6	169.8	1.8	1.9	2.2
Fuel oil and coal	17.7	13.1	13.8	15.5	-3.0	.6	1.1
Tobacco products	65.6	52.0	42.8	46.5	-2.3	-1.9	.8
Drugs and medicines	54.5	80.3	139.9	316.6	4.0	5.7	8.5
Other nondurable goods	138.9	194.3	305.7	497.5	3.4	4.6	5.0
Services	1,858.4	2,616.2	3,527.7	4,784.5	3.5	3.0	3.1
Housing	541.5	696.2	850.1	1,070.2	2.5	2.0	2.3
Household operation	202.9	259.8	377.6	579.2	2.5	3.8	4.4
Electricity	66.7	83.2	103.9	137.7	2.2	2.2	2.9
Natural gas	31.1	29.5	32.8	30.8	-.5	1.1	-.6
Telephone	40.0	62.6	141.8	296.2	4.6	8.5	7.6
Other	66.2	85.9	100.8	142.5	2.6	1.6	3.5
Transportation services	124.7	173.4	251.3	318.5	3.4	3.8	2.4
Motor vehicle leases	—	5.5	37.6	49.1	(²)	21.2	2.7
Other	—	168.1	213.6	269.2	(²)	2.4	2.3
Medical services	487.6	710.9	903.9	1,174.9	3.8	2.4	2.7
Recreation services	79.7	145.0	227.0	408.1	6.2	4.6	6.0
Personal business services	242.8	363.2	554.8	759.0	4.1	4.3	3.2
Financial services	94.4	154.2	222.7	292.5	5.0	3.7	2.8
Other	147.4	209.0	332.4	467.4	3.6	4.7	3.5
Other services	170.8	267.0	362.3	488.3	4.6	3.1	3.0
Residual ³	-35.6	-20.5	-68.7	-789.4	...	...	...
Personal consumption expenditures + GDP	65.2	66.7	67.8	68.5	...	...	...

¹ Undefined because of denominator with value zero.² Not applicable.³ The residual is the difference between the first line and the sum of the most detailed lines.

NOTE: Dash indicates data not available.

SOURCES: Historical data, Bureau of Economic Analysis; projected data, Bureau of Labor Statistics.

Of the three consumption categories, consumer durables have had the fastest growth in the past and are projected to remain fastest in the future. Durable goods grew at a remarkable rate of 6.3 percent per year between 1990 and 2000. Personal computers grew 52.1 percent annually, and software was up 43.7 percent a year, truly a noteworthy surge in consumer spending. The Bureau projects that the growth of personal computers and software will slow a bit over the 2000–10 period, to 22.1 percent and 7.4 percent annually, respectively, but will still remain the main force behind the growth of consumer durables, at 5.0 percent annually, during the 2000–10 period.

The growth of individuals' purchases of nondurable goods is also projected to accelerate, from a 3.1-percent annual rate during 1990–2000 to a 3.6-percent annual rate between 2000 and 2010—solid growth, but considerably slower than the growth of expenditures for consumer durable goods. As a person's income

risks, the proportion of that income spent on nondurable goods such as food and clothing increases at a slower pace than it increased at lower levels of income.⁸ However, the category of drugs and medicines, a component of nondurable-goods purchases, is anticipated to enjoy a healthy 8.5-percent growth in the 2000–10 period, due to the aging of the baby-boom generation, strong demand for prescription drugs and medicines, and a burgeoning array of new pharmaceuticals that increasingly are being marketed directly to consumers by way of aggressive media advertising campaigns.

Services are projected to grow at a rate of 3.1 percent annually during 2000–10, slightly faster than the 1990–2000 growth rate. Population growth during the projection period is expected to boost demand for housing services and household operations—telephone services in particular. Significant growth in housing services, along with rapid

growth in recreation services, is responsible for the overall growth of the service sector.

Personal consumption expenditures are presented in table 1 as they appear in the National Income and Product Accounts, including their import content. In order to measure *domestic* employment generated by consumer spending, these consumption estimates must be adjusted to reflect only domestically produced goods and services. Accordingly, consumption levels adjusted for their import content are presented in table 2 and are used to estimate the growth of both output and employment associated with consumer spending.

Consumer spending and employment

Consumer spending has always been a major generator of employment. Table 2 shows the level and growth rate of personal consumption expenditures and their relative share of total final demand for domestically produced commodities from 1985 to 2010. The table also shows consumer-related employment and its share of total employment for the same period. The share of personal consumption expenditures spent on domestic production declined from 61.3 percent in 1985 to 59.1 percent in 2000. The share of employment related to personal consumption expenditures, however, increased from 61.5 percent to 62.2 percent over the same period. The Bureau projects that consumer spending will make up 55 percent of final demand in 2010 and will generate 61 percent of total employment in the economy that year.

The decreasing share of consumer spending in total domestic final demand is expected to occur simultaneously with an increasing share of investment. In the most recent BLS projections of the U.S. economy, the growth of business investment outpaces that of household consumption as companies continue to invest in technology to enhance productivity.⁹ However, historically, the share of consumer-related employment in final demand has stayed relatively stable at about 61 percent to 63 percent between 1985 and 2000.

During 1990–2000, consumer spending on domestically produced goods and services increased 3.3 percent per year. The employment generated from this spending grew at 1.8 percent annually. The Bureau projects that, over the 2000–10 period, consumer spending will grow 3.6 percent annually and the employment generated by consumption will grow 1.3 percent each year. The reason that the growth of consumer-related employment is expected to be less than the growth of consumer expenditures on domestically produced goods and services is that increases in productivity improvements and trends in efficiency and automation will likely result in more labor-saving modes of production and changes in input requirements of the industries, both of which tend to dampen employment growth.

Consumer-related employment within industries and by occupation is influenced by the following factors:

- *The size of consumer spending and its detailed commodity distribution.* Changes in the distribution and composition of consumer spending create varying levels of employment across industries and among occupations.
- *Changes in technology.* Changes in technology have been quite significant in some industries, such as computers and communications, while other industries have experienced slower rates of technological growth. Shifts in technology have greatly affected the labor intensity of many industries, resulting in less employment in some areas even while consumption continues to increase.
- *Import shares.* Purchases of imports of goods and services by consumers, businesses, and governments generally have an effect, albeit limited, on employment related to personal consumption expenditures. For example, rising imports of apparel and shoes have cut into domestic production of these items and have lowered related domestic employment.
- *Labor productivity.* The growth of nonfarm labor productivity is projected to average 2.4 percent per year from 2000 through 2010, continuing the very strong productivity growth experienced in the Nation since 1995.

Consumer spending and major industries

The U.S. economy is composed of a broad range of industries with different characteristics. Industries are characterized as either goods producing or service producing. Goods-producing industries include agriculture, forestry, and fishing; mining; construction; and manufacturing. Service-producing industries encompass transportation, communications, and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; services; and government. Continuing a longstanding trend, the U.S. economy is experiencing a shift from goods-producing employment to service-producing employment. This trend can be seen in historical data, as well as in the projected numbers for the 2000–10 period, during which virtually all employment growth is expected to occur in service-producing industries. (See table 2.)

Personal consumption expenditures from the goods-producing sector grew at annual rate of 2.7 percent during 1990–2000, even as consumer-related employment in the sector declined at an annual rate of 0.7 percent. Meanwhile, over the same period, purchases from the service-producing sector grew at an annual rate of 3.5 percent, with an accompanying 2.3-percent increase in consumer-related employment. The Bureau projects that consumer-generated employment in the goods-

Consumer Spending and U.S. Growth

Table 2. Domestic consumption and employment, by major industry sector, 1985, 1990, 1995, and 2000 (actual) and 2010 (projected)

Sector	Personal consumption expenditures on domestically produced commodities (billions of 1996 dollars)					Domestic final demand spending (billions of 1996 dollars)				
	1985	1990	1995	2000	2010	1985	1990	1995	2000	2010
All sectors	3,698.3	4,295.9	4,849.0	5,969.5	8,492.7	6,035.7	7,030.9	7,956.5	10,101.6	15,457.8
Goods producing	693.4	760.3	818.2	994.5	1,650.5	1,965.5	2,200.1	2,472.6	3,339.4	5,724.7
Agriculture, forestry, and fisheries ...	24.8	31.9	36.7	46.3	60.8	52.9	59.4	58.4	78.6	107.1
Mining	2	.1	.1	.2	.1	39.7	28.7	28.2	36.6	40.1
Construction .....	.0	.0	.0	.0	.0	594.9	608.7	626.0	779.3	993.9
Manufacturing	668.5	728.3	781.4	948.0	1,589.6	1,278.0	1,503.3	1,760.1	2,444.9	4,583.5
Durables	165.9	188.0	205.7	325.0	816.1	659.5	800.6	970.3	1,565.0	3,417.4
Nondurables	502.5	540.3	575.7	623.0	773.5	618.5	702.7	789.7	879.9	1,166.1
Service producing	3,004.9	3,535.6	4,030.8	4,975.1	6,842.1	4,070.2	4,830.8	5,483.9	6,762.2	9,733.1
Transportation	80.2	86.2	106.5	140.2	197.4	140.1	172.0	211.2	255.3	382.6
Communication	62.8	85.2	112.5	167.2	337.4	75.9	103.9	136.1	201.7	388.0
Utilities	127.3	139.5	151.8	164.0	203.5	142.9	162.5	179.8	198.6	248.4
Trade	772.8	904.3	1,036.5	1,365.3	1,878.7	882.8	1,044.5	1,227.5	1,629.3	2,513.2
Finance, insurance, and real estate	900.9	1,033.4	1,162.1	1,391.8	1,956.6	977.1	1,129.4	1,286.5	1,563.0	2,272.8
Services	1,015.3	1,261.8	1,448.2	1,721.8	2,267.7	1,077.3	1,348.0	1,570.0	2,027.0	2,962.2
Government	30.9	35.2	37.2	41.4	60.4	813.1	913.7	928.4	987.0	1,078.3
Special industries	14.7	-10.0	-24.1	-16.6	-59.6	-39.0	-43.2	-55.6	-99.7	-112.4
Sector	Consumer-related employment (thousands)					Total employment (thousands)				
	1985	1990	1995	2000	2010	1985	1990	1995	2000	2010
All sectors	61,342	69,283	75,149	83,180	94,515	99,740	111,580	119,361	133,741	155,722
Goods producing	11,769	11,424	10,929	10,652	10,216	26,510	26,712	26,239	27,921	29,668
Agriculture, forestry, and fisheries ...	1,202	1,321	1,492	1,594	1,809	1,665	1,806	1,973	2,211	2,611
Mining	360	283	212	174	127	928	709	581	543	488
Construction	822	730	614	791	813	4,668	5,120	5,160	6,698	7,522
Manufacturing	9,385	9,089	8,612	8,093	7,467	19,250	19,077	18,524	18,469	19,047
Durables	3,397	3,142	2,982	3,043	2,884	11,461	11,109	10,683.3	11,138	11,780
Nondurables	5,988	5,947	5,629	5,050	4,583	7,789	7,968	7,841	7,331	7,267
Service producing	49,573	57,860	64,219	72,528	84,299	73,230	84,868	93,122	105,820	126,055
Transportation	1,797	2,001	2,226	2,624	2,993	2,997	3,510	3,904	4,529	5,466
Communication	1,014	1,003	1,017	1,258	1,480	1,318	1,309	1,318	1,639	1,916
Utilities	715	735	693	629	630	916	957	911	851	893
Trade	19,243	21,506	23,010	25,730	27,769	23,048	25,774	27,565	30,331	34,200
Finance, insurance, and real estate	5,066	5,703	5,759	6,310	6,547	5,950	6,709	6,806	7,560	8,247
Services	20,294	25,356	29,999	34,560	43,495	22,607	28,305	33,313	40,230	52,898
Government	1,443	1,555	1,515	1,417	1,386	16,394	18,304	19,306	20,680	22,436
Special industries .....	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sector	Personal consumption expenditures as a percent of domestic final demand spending					Annual average growth rate of personal consumption expenditure (percent)				
	1985	1990	1995	2000	2010	1985-90	1990-95	1995-2000	1990-2000	2000-10
All sectors	61.3	61.1	60.9	59.1	54.9	3.0	2.5	4.2	3.3	3.6
Goods producing	35.3	34.6	33.1	29.8	28.8	1.9	1.5	4.0	2.7	5.2
Agriculture, forestry, and fisheries ...	46.8	53.7	62.9	58.9	56.8	5.2	2.8	4.7	3.8	2.8
Mining .....	.4	.5	.5	.5	.3	-4.6	.9	3.8	2.3	-2.3
Construction .....	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Manufacturing	52.3	48.4	44.4	38.8	34.7	1.7	1.4	3.9	2.7	5.3
Durables	25.2	23.5	21.2	20.8	23.9	2.5	1.8	9.6	5.6	9.6
Nondurables	81.2	76.9	72.9	70.8	66.3	1.5	1.3	1.6	1.4	2.2
Service producing	73.8	73.2	73.5	73.6	70.3	3.3	2.7	4.3	3.5	3.2
Transportation	57.2	50.1	50.4	54.9	51.6	1.5	4.3	5.6	5.0	3.5
Communication	82.7	82.0	82.7	82.9	87.0	6.3	5.7	8.2	7.0	7.3
Utilities	89.1	85.9	84.4	82.6	81.9	1.8	1.7	1.6	1.6	2.2
Trade	87.5	86.6	84.4	83.8	74.8	3.2	2.8	5.7	4.2	3.2
Finance, insurance, and real estate	92.2	91.5	90.3	89.0	86.1	2.8	2.4	3.7	3.0	3.5
Services	94.2	93.6	92.2	84.9	76.6	4.4	2.8	3.5	3.2	2.8
Government	3.8	3.9	4.0	4.2	5.6	2.6	1.1	2.2	1.7	3.8
Special industries	-37.7	23.1	43.4	16.7	53.0	-192.5	19.3	-7.2	5.2	13.6

Table 2. Continued—Domestic consumption and employment, by major industry sector, 1985, 1990, 1995, and 2000 (actual) and 2010 (projected)

Sector	Consumer-related employment as a percent of total employment					Annual average growth rate of employment as a result of personal consumption expenditures (percent)				
	1985	1990	1995	2000	2010	1985-90	1990-95	1995-2000	1990-2000	2000-10
All sectors	61.5	62.1	63.0	62.2	60.7	2.5	1.6	2.1	1.8	1.3
Goods producing	44.4	42.8	41.7	38.2	34.4	-.6	-.9	-.5	-.7	-.4
Agriculture, forestry, and fisheries ...	72.2	73.1	75.6	72.1	69.3	1.9	2.5	1.3	1.9	1.3
Mining	38.8	39.9	36.5	32.1	26.1	-4.7	-5.6	-3.9	-4.7	-3.1
Construction	17.6	14.3	11.9	11.8	10.8	-2.3	-3.4	5.2	.8	.3
Manufacturing	48.8	47.6	46.5	43.8	39.2	-.6	-1.1	-1.2	-1.2	-.8
Durables	29.6	28.3	27.9	27.3	24.5	-1.5	-1.0	.4	-.3	-.5
Nondurables	76.9	74.6	71.8	68.9	63.1	-.1	-1.1	-2.1	-1.6	-1.0
Service producing	67.7	68.2	69.0	68.5	66.9	3.1	2.1	2.5	2.3	1.5
Transportation	60.0	57.0	57.0	57.9	54.8	2.2	2.2	3.3	2.7	1.3
Communication	76.9	76.6	77.2	76.8	77.3	-.2	.3	4.3	2.3	1.6
Utilities	78.0	76.8	76.1	73.9	70.6	.6	-1.2	-1.9	-1.5	.0
Trade	83.5	83.4	83.5	84.8	81.2	2.2	1.4	2.3	1.8	.8
Finance, insurance, and real estate	85.1	85.0	84.6	83.5	79.4	2.4	.2	1.8	1.0	.4
Services	89.8	89.6	90.1	85.9	82.2	4.6	3.4	2.9	3.1	2.3
Government	8.8	8.5	7.8	6.9	6.2	.0	.0	.0	.0	.0
Special industries .....	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

NOTE: The negative values of personal consumption expenditures in special industries result from an accounting convention used to move expenditures in the United States by foreigners from personal consumption expenditures to exports. The negative values of total final demand spending in special industries result from this same accounting convention, as well

as from the impact of the noncomparable imports industry (goods not capable of being produced in the United States) and the scrap, used, and secondhand goods industries. Total final demand spending in mining is negative because purchases of imports outvalue purchases of domestically produced goods.

producing sector will continue to decline, despite a 5.2-percent annual rate of growth in production, while employment in the service-producing sector will grow at a 1.5-percent rate, with about 12 million jobs added as a result of consumer spending.

Goods-producing sector. Although consumer expenditures on the goods-producing sector of the economy are projected to increase by 5.2 percent over the 2000–10 period, growth within the different industries is likely to vary significantly and have a differential impact on employment. Continuing the trend from 1990 to 2000, employment in the goods-producing sector is projected to decline by 0.4 percent per year, with the sector losing approximately 440,000 jobs over the 2000–10 period.

Within the goods-producing sector, the only two industries that are projected to have a positive growth rate of employment are agriculture, fisheries, and forestry, at 1.3 percent per year, and construction, increasing by 0.3 percent each year. The projected 1.3-percent growth rate of employment in agriculture, fisheries, and forestry is due primarily to BLS expectations regarding landscape and horticulture services and veterinary services. The expected 0.3-percent rate in the construction industry is based on the anticipated demand for new housing and continued growth in the construction of roads, bridges, and tunnels. Every other industry in the goods-producing sector is projected to have negative employment growth, despite consistent increases in consumer spending over the projection horizon.

Service-producing sector. Within the service-producing industries, the largest impact of consumer spending is on the

services sector, which is projected to add a net 8.9 million new jobs by 2010. The services sector encompasses a variety of different subsectors, such as personal services; auto repair services and garages; miscellaneous repair shops; motion picture, amusement, and recreation services; business services; health services; and social services. The different categories of services are mostly labor-intensive industries with varying amounts of labor productivity, which is usually difficult to measure. More than three-fourths of the projected job growth in the services sector is concentrated in the last three subgroups—business services, health services, and social services:

1. *Business services.* Business services includes a variety of different services, such as computer and data-processing services, personnel supply services, advertising, services to buildings and miscellaneous equipment, and rental and leasing services. The business services group is expected to be the fastest-growing industry group in the services division.
2. *Health services.* The health services component, which includes hospitals, offices of health practitioners, and health-care services, is anticipated to add a large number of new jobs as aging baby boomers—the population born between 1946 and 1964—demand more of these types of service. It is worth noting that the baby boomers will be aged 46 years to 64 years in 2010.

Consumer Spending and U.S. Growth

3. *Social services.* Social services include day care and residential care services. As the labor force participation rate of women in all age groups has increased, the demand for child care has accelerated, and this trend is expected to continue into the next decade. Employment in residential care services also is projected to increase as a result of the aging cohorts of the population looking for alternatives to nursing homes and hospital care.

Projections for the other industries within the service-producing sector are as follows:

4. *Communications.* Communications services are another high-employment sector that is projected to grow as a result of consumer spending. The dominant industries in this sector are telephone and telegraph communications and the communications service industry. Strong demand for residential and business wired and wireless systems, cable systems, and high-speed Internet connections are expected to contribute to a 1.6-percent growth rate of employment in the sector.
5. *Transportation.* An increase of 3.5 percent in consumer demand and expenditure is anticipated to permit the transportation sector to enjoy a 1.3-percent rise in employment. The growth in the industry is projected to be led by an increase in employment in the trucking, courier services, and warehouse and storage industries. Trucking and warehousing are expected to provide the most new jobs. As a result of population growth and urban sprawl, local and urban passenger transit also is projected to account for a large number of new jobs in the sector.
6. *Wholesale and retail trade.* In general, overall economic growth drives both of these industries, which provide the means for getting products from manufacturers to consumers. Because consumption accounts for such a large share of economic growth, employment related to consumption in these industries is expected to be quite large as well.
7. *Finance, insurance, and real estate.* Employment growth in this sector is expected to decline from the 1990–2000 rate of 1.0 percent to 0.4 percent in the 2000–10 period. The finance sector of the industry—including depository and nondepository institutions and securities and commodity brokers and dealers—is projected to grow as a result of the financial needs of the baby-boom generation, which will be at the height of its saving years. The growth of tax-favorable retirement plans and the globalization of securities markets are other factors aiding employment growth in this sector. Counter to the trend, however, employment in depository institutions

is expected to decline, due to the surge in Internet banking, automated teller machines, and debit cards.

Industry ranking

Consumer-related employment as a percent of total employment was estimated and ranked for 192 industry groups in 2000 and also projected for 2010. The resulting ranking shows that most of the 192 industries are dependent on consumer spending to some degree, either directly or indirectly. The degree to which an industry depends on consumer spending for employment can be estimated by the ratio of consumption-related employment to total employment for each industry. Table 3 lists the 22 industries that are most dependent on consumer spending. All but one of these industries (private households) is a service-producing industry.

As a result of high consumer demand stemming from the combined effects of the aging of the population and advances in medical technology, the health services group is projected to be a prime source of consumer-related employment. Top industries providing health services are hospitals, offices of health practitioners, and nursing and personal care facilities. In

Table 3. Consumer-related employment as a percent of total employment, 2000 (actual) and 2010 (projected)

Industry	Employment generated by consumption as a percent of total industry employment	
	2000	2010
Other lodging places	100.0	100.0
Hospitals	100.0	100.0
Educational services	100.0	100.0
Health services, n.e.c.	100.0	100.0
Museums and botanical and zoological gardens	100.0	100.0
Bowling centers	100.0	98.6
Private households	100.0	100.0
Amusement and recreation services, n.e.c.	99.9	100.4
Beauty and barber shops	99.5	99.2
Nursing and personal-care facilities	99.3	99.1
Offices of health practitioners	99.1	98.4
Funeral services and crematories	99.0	98.1
Videotape rental	98.8	97.7
Membership organizations	98.7	97.8
Eating and drinking places	98.4	97.8
Child day care services	97.5	97.7
Personal services, n.e.c.	97.4	95.8
Individual and miscellaneous social services	96.8	96.9
Watch, jewelry, and furniture repair	96.6	96.3
Cable and pay television services	96.3	94.8
Beverages	94.7	92.1
Residential care	94.4	95.4
Retail trade, excluding eating and drinking places	93.8	89.8

NOTE: n.e.c. = not elsewhere classified.

the 2000–10 projection period, the aging of the baby-boom generation is expected to lead to the expansion of outpatient and ambulatory services and the continued expansion of home health care services, producing greater employment opportunities in the health-related industries.

Educational services, a labor-intensive industry with a strong link to consumer spending, is anticipated to be another top employment generator. High demand for education, mainly as a result of a growing elementary-school-age population, as well as an increasing need for postsecondary education and corporate training services, will keep this industry a large generator of employment during 2000–10.

Projected strong growth in income and the resulting consumer affluence will likely benefit industries with high income elasticities of demand, such as recreation industries, as consumers spend more resources on leisure time and sports activities. The Bureau anticipates that museums, botanical and zoological gardens, bowling centers, amusement and recreation services, videotape rental services, and cable and pay television services will create a vast amount of employment, virtually all from consumer demand.

Retail trade continues to generate large employment increases, due to population growth and rising disposable income, as well as the labor-intensive nature of the industry. Similarly, all sectors of the restaurant industry—fast-food establishments, moderately priced restaurants, and fine-dining establishments, are expected to maintain their position as another large generator of employment.

Although service-producing industries increasingly have been responsible for the largest share of employment related to consumer spending, some manufacturing industries, such as household furniture, jewelry, silverware, and plated ware, as well as toys and sporting goods, also have been, and are projected to remain, among the large creators of employment. (See table 3.)

Major occupational groups

Employment generated by consumer spending is distributed across all occupations, to varying degrees. The transition from industry employment to occupational employment is accomplished through the use of an industry-occupation matrix that shows staffing patterns, or share distributions of occupations within each industry. Staffing patterns in various industries are developed by the BLS Occupational Employment Statistics survey.

The distribution of employment among the 10 major occupational groups listed in the Standard Occupational Classification Manual¹⁰ is shown in table 4. It should not be surprising that, among these groups, service occupations rank as the largest generator of consumer-related employment, with 19.5 million jobs in 2000. The category is expected to maintain its leading position in 2010, with a projected 23.4 million jobs owing, at least in part, to consumer spending. In 2010, consumer spending employment as a percent of total employment is anticipated to be 80 percent, the same as in 2000.

Professional and related occupations accounted for 13.2 million jobs in 2000, good enough for a third-place ranking. During the 2000–10 period, the group is expected to create 3.9 million additional jobs as a result of consumer expenditures, moving it up to second place in 2010. Office and administrative support occupations employed 15.1 million of the workforce and ranked second in 2000. Over the 2000–10 period, the category is projected to create 874 thousand additional jobs as a result of consumer spending, placing it third in 2010. Two occupational groups—farming, fishing, and forestry; and production—are expected to see their total number of jobs related to consumer spending decline, due chiefly to the adoption of new technologies, ongoing productivity gains,

Table 4. Consumer-related employment, by major occupational group, 2000 (actual) and 2010 (projected)

[Numbers in thousands of jobs]

Major occupational group	Total wage and salary employment		Consumer-related employment			Consumer-related employment as a percent of total employment		Average annual rate of change in employment (percent)	
	2000	2010	2000	2010	Change	2000	2010	Total	Related to consumption
Total, all occupations	133,741	155,722	83,179	94,513	11,334	62.2	60.7	1.5	1.3
Management, business, and financial	12,637	14,849	7,267	8,241	974	57.5	55.5	1.6	1.3
Professional and related occupations	24,844	31,601	13,192	17,112	3,920	53.1	54.2	2.4	2.6
Service	24,321	29,293	19,477	23,416	3,939	80.1	79.9	1.9	1.9
Sales and related occupations ..	13,430	15,294	10,992	11,894	902	81.8	77.8	1.3	.8
Office and administrative support	23,393	25,640	15,078	15,952	874	64.5	62.2	.9	.6
Farming, fishing, and forestry ..	1,231	1,299	829	823	-6	67.4	63.4	.5	-.1
Construction and extraction	6,135	7,002	1,121	1,217	96	18.3	17.4	1.3	.8
Installation, maintenance, and repair	5,382	6,053	3,213	3,485	272	0.7	57.6	1.2	.8
Production	12,699	13,496	6,252	6,089	-163	49.2	45.1	.6	-.3
Transportation and material moving	9,669	11,194	5,719	6,250	531	59.1	55.8	1.5	.9

Consumer Spending and U.S. Growth

and a continuing gradual substitution of capital for labor, especially in the production sectors of the economy.

Of the major occupational groups, professional and related occupations are projected to grow the fastest, 2.6 percent between 2000 and 2010, twice the rate of growth of overall occupational change. The high employment growth of this group is predicated largely upon an increase in demand for some of its jobs. A variety of computer-related and health services occupations, including physician's assistants and dentists, dental hygienists, physical therapists, nuclear medicine technologists, respiratory therapists, and radiological technologists, belong to the group.

At a projected rate of 1.9 percent per year, the service occupations group would have the second-highest rate of employment growth from 2000 to 2010. This rate is the same for both consumer-related and total service employment. Service occupations are a major generator of jobs. Within the category, health care support occupations, social services occupations, and protective service occupations are among the fastest-growing subgroups.

The most rapidly growing occupations in the professional and related occupations major group are concentrated in industries with high rates of growth. In contrast, production occupations are projected to grow more slowly than overall employment, largely because nearly 3 out of 4 such occupations are in the slow-growing manufacturing sector.¹¹ Production occupations, which have the lowest growth among all occupations, include farming, fishing, and forestry occupations; construction and extraction occupations; and installation, maintenance, and repair occupations.

Detailed occupations

At a detailed level, the Bureau projects employment for almost 350 occupations for the U.S. economy. Consumption-related employment estimates for each of these occupations were sorted by their average annual growth over the projection period. The occupations projected to be the fastest growing are listed in table 5. Professional and related occupations, including computer support specialists and systems administrators, computer software engineers, systems analysts, computer scientists, database administrators, and desktop publishers, dominate the list. Computer support specialists and systems administrators, and computer software engineers, have the highest projected annual growth rates, 5.7 percent and 5.6 percent, respectively. Increasing demand for computer-related occupations is expected to reflect ongoing momentous advances in high technology and the continuing development of new computer applications, as well as the rising use of highly sophisticated software by an increasingly computer-aware group of consumers.

A number of other occupations from the service occupa-

tions group are projected to have significant rates of growth, including medical assistants, physician's assistants, medical records and health information technicians, physical therapist assistants and aides, and occupational therapists. Rapid growth among health-related occupations demonstrates the aging of the baby-boom generation and the increasing stratification by skill level of the health care professions. In addition, a wealthier population is better able to afford quality health care, and advances in medical technology permit an increasing number of health problems to be treated more effectively.¹² The demand for special-education teachers is expected to grow by 4.2 percent annually as a result of an increase in the number of people with certain needs and disabilities that, sometimes by law, require special education.

Note that the rankings in table 5 are based on the growth rates of the occupations and not on the actual number of jobs generated. Some high-growth occupations with a small employment base will create small numbers of jobs, while some slow-growing occupations with a large base will provide a large number of new job opportunities.

Table 6 lists the detailed occupations employing the highest number of employees, both in 2000 and projected for 2010. A variety of service occupations, including food and beverage servers and related workers; chefs, cooks, and food preparation workers; and building cleaning workers, are at the top of the list. Some sales occupations, such as retail salespersons and cashiers, also are expected to maintain a large number of jobs. Other occupations with a large number of workers are the health-related jobs, including registered nurses and psychiatric and home health aides. Office and administrative occupations, such as information and record clerks, secretaries and administrative assistants, and financial clerks, also are among the large-base occupations. Human services assistants, nurses, medical assistants, physician's assistants, and physical therapist assistants and aides are among the fastest-growing professional specialty occupations. The rapid growth of service industries, in addition to the fact that 75 percent of the entire professional specialty occupations are located within the service industries, explains the large number of job openings in the aforementioned occupations.

CONSUMER DEMAND IS THE MAIN FORCE BEHIND THE U.S. ECONOMY and, by extension, is the prime source of employment and economic growth. The significant share of GDP held by personal consumption expenditures gives consumers a power—reflected in their preferences—to command the direction and propel the growth of output and employment in many different sectors of the economy. The analysis and projections presented in this article indicate that, over the 2000–10 period, consumer expenditures will continue to shift employment from goods-producing to service-producing industries. Service-producing industries—including transportation, com-

Table 5. Projected fastest-growing occupations, 2000–10

[Numbers in thousands of jobs]

Occupation	Employment		Change	Average annual rate of growth (percent)
	2000	2010		
Computer support specialists and systems administrators	324	566	242	5.73
Computer software engineers	179	308	129	5.58
Semiconductor processors	10	16	7	5.31
Personal and home care aides	416	681	265	5.05
Social and human service assistants	193	3165	123	5.04
Medical assistants	316	502	186	4.75
Physician assistants	54	86	32	.74
Medical records and health information technicians	128	197	69	4.38
Desktop publishers	26	39	13	4.26
Speech-language pathologists and audiologists	56	84	29	4.22
Teachers, special education	116	174	59	4.19
Physical therapist assistants and aides	79	117	38	3.98
Veterinarians	37	55	18	3.93
Systems analysts, computer scientists, and database administrators	329	482	153	3.90
Occupational therapist assistants and aides	23	33	10	3.78

Table 6. Occupations with the largest consumer-related employment, 2000 (actual) and 2010 (projected)

[Numbers in thousands of jobs]

Occupation	2000	2010	Change	Average annual rate of growth (percent)
Food and beverage servers and related workers	6,105	7,195	1,090	1.66
Retail salespersons	3,593	3,899	306	.82
Information and record clerks	3,480	4,064	584	1.56
Cashiers	3,054	3,365	312	.98
Material-moving occupations	2,996	3,186	190	.62
Building cleaning workers	2,928	3,182	254	.83
Chefs, cooks, and food preparation workers	2,448	2,768	320	1.24
Material recording, scheduling, dispatching, and distributing occupations, except postal workers	2,351	2,380	29	.12
Financial clerks	2,330	2,364	35	.15
Secretaries and administrative assistants	2,270	2,421	151	.65
Registered nurses	1,981	2,579	598	2.67
Nursing, psychiatric, and home health aides	1,8378	2,439	601	2.87
Top executives	1,802	1,982	181	.96
Truckdrivers and drivers/sales workers	1,767	1,949	182	.98
Office clerks, general	1,622	1,833	211	1.23
Sales worker supervisors	1,338	1,430	92	.67
Teachers, preschool, kindergarten, and elementary, middle, and secondary school	1,231	1,585	354	2.56

munication, and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services—are expected to account for nearly all of the 11.3 million new wage and salary jobs generated by consumer spending over the period. Continuing the employment growth patterns of the 1990–2000 period, the services and trade industry divisions will amount to nearly 97 percent of new wage and salary employment growth.

Services make up the largest and also the fastest-growing major industry group whose growth is due to consumer spending. Services are projected to add 8.9 million new jobs over

the 2000–10 period, so that by 2010, the sector will provide employment for nearly 85.3 million people. More than three-fourths of this projected job growth is concentrated in three sectors of service industries: business services, health services, and social services. The expansion of the service-producing industries is anticipated to create demand for many service-related occupations, but the expected employment growth is likely to be different among different occupational groups, with professional and related occupations and service occupations growing the fastest and generating more jobs than any other occupational group over the projection horizon. □

Consumer Spending and U.S. Growth

Notes

¹ Personal consumption expenditures are defined as the market value of spending by individuals and not-for-profit institutions on all goods and services. Personal consumption expenditures also include the value of certain imputed goods and services—such as the rental value of owner-occupied homes—and compensation paid in kind—such as employer-paid health and life insurance premiums. After-tax wages, salaries, interest income, dividends, and property income, in addition to transfer payments such as Social Security, unemployment insurance, and welfare payments, are the main sources of income at consumers' disposal for spending.

² For a more complete discussion of the methodology used, see *BLS Handbook of Methods*, Bulletin 2414 (Bureau of Labor Statistics, September 1992), chapter 15, "Employment Projections," pp. 128–39.

³ *Ibid.*

⁴ The input-output tables for the U.S. economy were last published in *Benchmark input-output accounts of the U.S., 1992* (U.S. Department of Commerce, Bureau of Economic Analysis, September 1998). The input-output model consists of two basic tables. The first, the "use" table, describes the sale of every commodity, both to final purchasers, for use in its unaltered state, and as an intermediate product, for use as an input to the production process of other industries. This table is so named because it reflects the use of commodities by industries. The second table, called the "make" table, displays the production of commodities by each industry and reflects the reality that a commodity can be produced by a multiplicity of industries.

⁵ Direct employment measures the employment actually necessary to produce a good or service within the producing

industry. Indirect employment is the employment generated in all of the industries that support the producing industry with their inputs. All of these employees, direct and indirect, earn income, and their income will generally be spent on consumer goods, which, in turn, will generate a third type of employment: induced employment (also referred to as "income multiplier effects on employment"). The Bureau of Labor Statistics does not attempt to measure induced employment.

⁶ The latest published Occupational Employment Statistics data are in *Occupational Employment and Wages, 2000*, Bulletin 2549 (Bureau of Labor Statistics, April 2002).

⁷ For further discussions, see Betty W. Su, "The U.S. economy to 2010," *Monthly Labor Review*, November 2001, pp. 3–20.

⁸ H. S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centenary of Engel's Law," *Econometrica*, 1957, pp. 332–551.

⁹ See Jay M. Berman, "Industry output and employment projections to 2010," *Monthly Labor Review*, November 2001, pp. 39–56.

¹⁰ *Standard Occupational Classification Manual* (U.S. Department of Commerce, October 2000).

¹¹ For a further discussion of the category, see Daniel E. Hecker, "Occupational employment projections to 2010," *Monthly Labor Review*, November 2001, pp. 57–84.

¹² *Ibid.*

EXHIBIT 12



WHAT IMMIGRATION MEANS FOR U.S. EMPLOYMENT AND WAGES

by Michael Greenstone and Adam Looney

The Hamilton Project

May 4, 2012 —

While employment continued to rise, [today's employment report](#) suggests that the pace of job growth slowed. Employer payrolls increased only by 115,000 jobs, following a gain of 154,000 last month and average increases of 252,000 per month in the three prior months. At last month's pace of job growth, increases in employment are roughly keeping up with increases in new labor market entrants and the unemployment rate was little changed at 8.1 percent.

U.S. immigration policy continues to be a key issue of debate among federal and state policymakers alike. In that debate, one area of disagreement has been the impact of immigration on the U.S. labor force and the wages of American workers—particularly during today's difficult economic times. In fact, because of the weak labor market immigration flows have changed dramatically since the start of the Great Recession—the undocumented population has declined ([Passel and Cohn 2010](#); [DHS 2012](#)), and the number of high-skilled H-1B visas being issued was down by over 25 percent in 2010 from a 2001 peak ([US State Department](#)). As the economy continues to recover, however, it is likely that demand for immigrant labor by American businesses and the desire of immigrants to work in the United States will continue to rise. The ability of our immigration system to respond to these demands remains an important economic policy issue, both in the short term and for our country's long-term growth strategy.

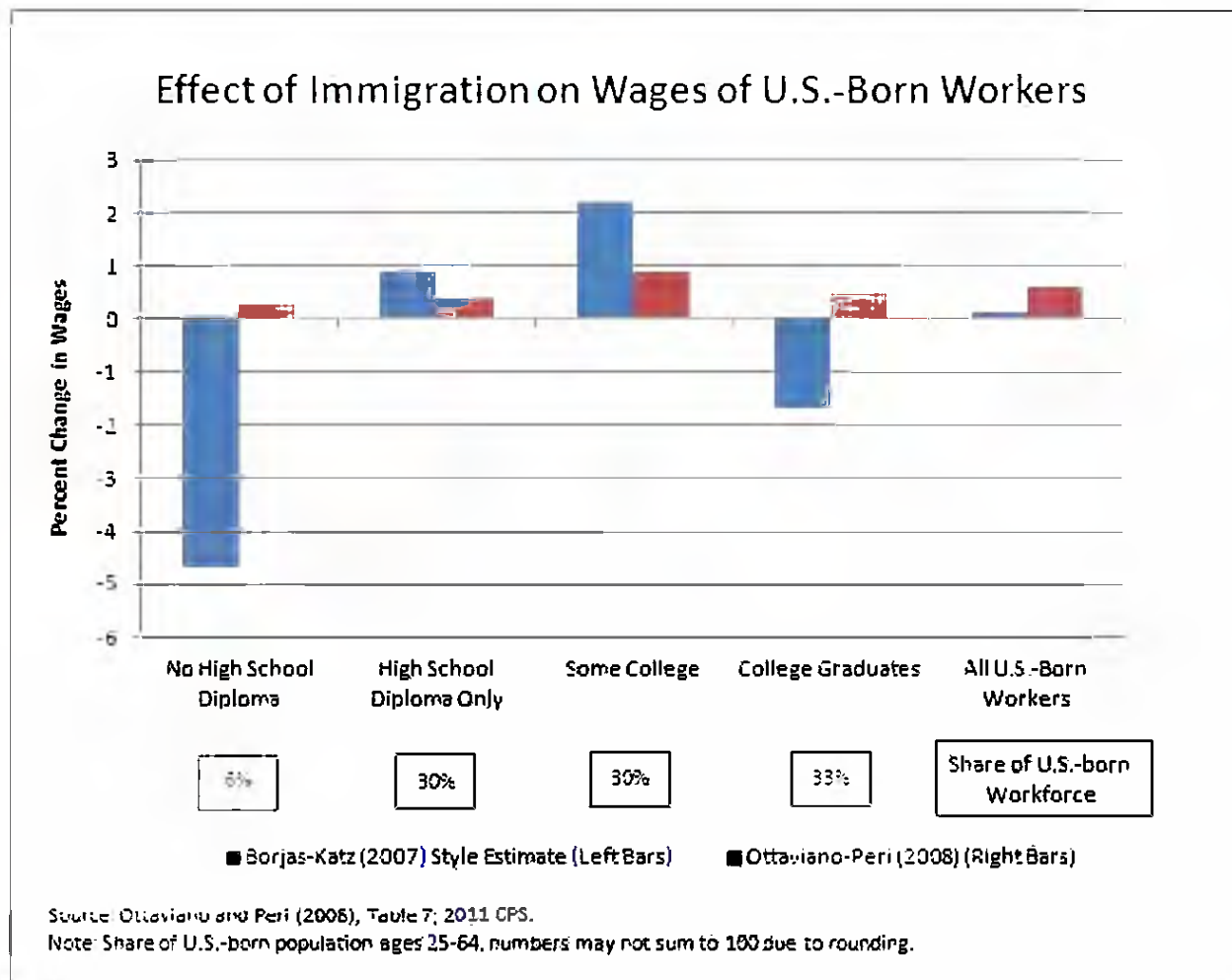
In this month's employment analysis, we discuss the economic evidence on what immigration means for U.S. jobs and the economy in advance of The Hamilton Project's [May 15th immigration forum](#) in Washington, DC. We also continue to update our analysis of the "jobs gap," or the number of jobs that the U.S. economy needs to create in order to return to pre-recession employment levels, releasing an [exciting new interactive feature](#) that allows readers to calculate when the country will close the jobs gap at different rates of job creation.

THE IMPACT OF IMMIGRANTS ON EMPLOYMENT AND EARNINGS

Although many are concerned that immigrants compete against Americans for jobs, the most recent economic evidence suggests that, on average, immigrant workers increase the opportunities and incomes of Americans. Based on a survey of the academic literature,

economists do not tend to find that immigrants cause any sizeable decrease in wages and employment of U.S.-born citizens ([Card 2005](#)), and instead may raise wages and lower prices in the aggregate ([Ottaviano and Peri 2008](#); [Ottaviano and Peri 2010](#); [Cortes 2008](#)). One reason for this effect is that immigrants and U.S.-born workers generally do not compete for the same jobs; instead, many immigrants complement the work of U.S. employees and increase their productivity. For example, low-skilled immigrant laborers allow U.S.-born farmers, contractors, and craftsmen to expand agricultural production or to build more homes—thereby expanding employment possibilities and incomes for U.S. workers. Another way in which immigrants help U.S. workers is that businesses adjust to new immigrants by opening stores, restaurants, or production facilities to take advantage of the added supply of workers; more workers translate into more business.

Because of these factors, economists have found that immigrants slightly raise the average wages of all U.S.-born workers. As illustrated by the right-most set of bars in the chart below, estimates from opposite ends of the academic literature arrive at this same conclusion, and point to small but positive wage gains of between 0.1 and 0.6 percent for American workers.



But while immigration improves living standards on average, the economic literature is divided about whether immigration reduces wages for certain groups of workers. In particular, some estimates suggest that immigration has reduced the wages of low-skilled workers and college graduates. This research, shown by the blue bars in the chart above, implies that the influx of immigrant workers from 1990 to 2006 reduced the wages of low-skilled workers by 4.7 percent and college graduates by 1.7 percent. However, other estimates that examine immigration within a different economic framework (the red bars in the chart) find that immigration raises the wages of all U.S. workers—regardless of the immigrants’ level of education.

A PATH FORWARD WITH AN ECONOMIC APPROACH TO IMMIGRATION REFORM

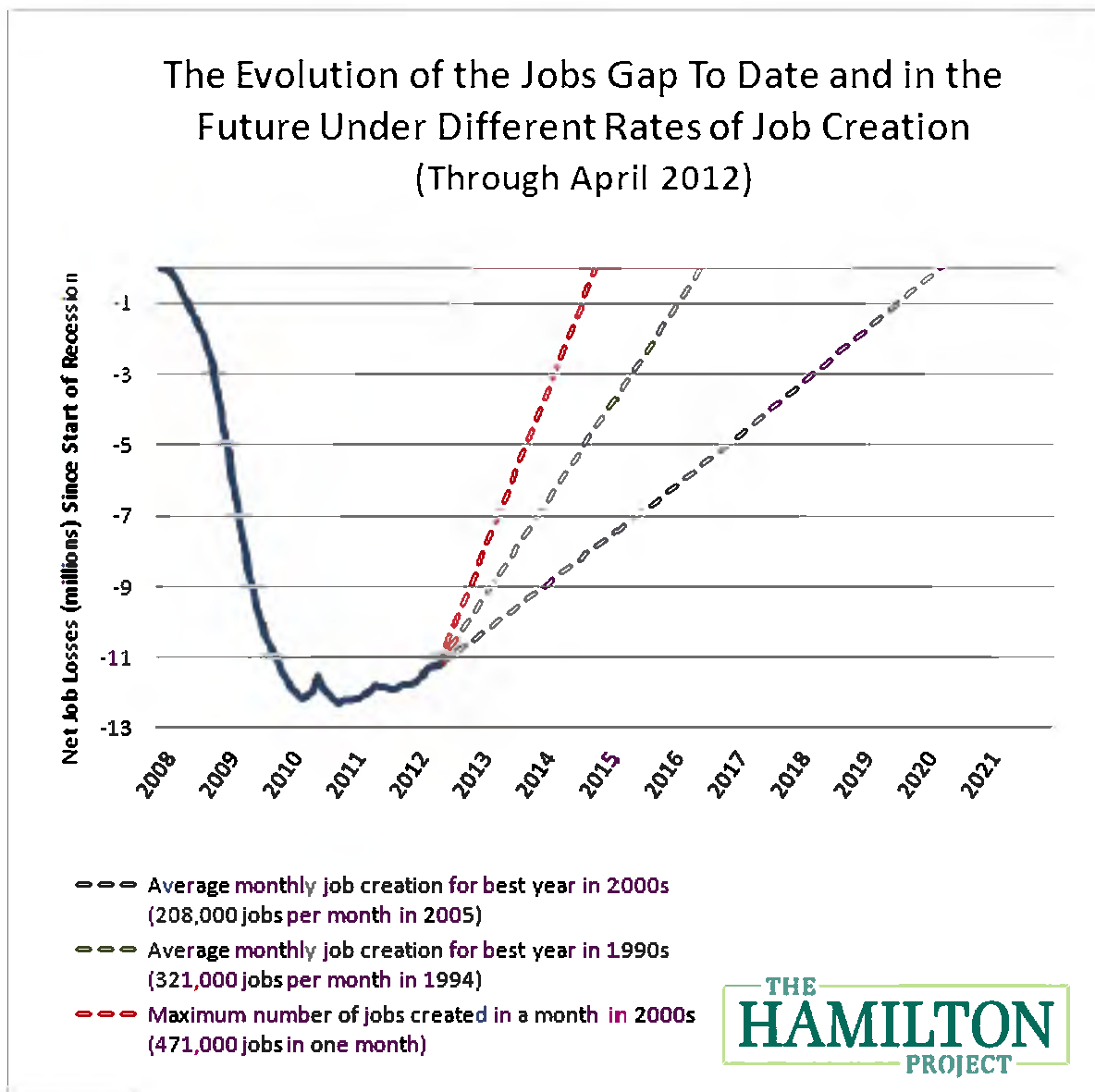
Our current immigration system has myriad challenges: dozens of overlapping visa categories—each with different quotas, costs, and durations—characterize the system of legal immigration, supplemented by country-specific caps, and even a randomized visa lottery. As a result, the system is plagued by problems, ranging from its cumbersome and costly application systems, to its inefficient ability to meet the needs of American families and an ever-changing economy. One measure of the inefficiency is the thousands of dollars in legal fees that many visa applicants must spend.

In a forthcoming discussion paper for The Hamilton Project, “Immigration Policies for Jobs, Productivity, and Growth,” University of California, Davis, Professor Giovanni Peri puts forward one approach to immigration reform that focuses on addressing economic concerns about the U.S. immigration system. Peri’s proposal has several steps, ranging from reforms of the current system to a wholesale restructuring. The first step of his proposal is to introduce a market-based auction system to allocate existing temporary employment visas. Rather than waiting in line to bring a worker into the country as an employer would do in the current system, employers would bid on a permit to sponsor that worker in an auction. Revenues from the auctions could be used to run the system and to compensate the state and local governments that have the largest fiscal burdens from immigration. The discussion paper, which will be released on May 15, details the other steps and reforms.

THE APRIL JOBS GAP

The Hamilton Project continues its monthly analysis of how the “jobs gap” has evolved since the start of the Great Recession in December 2007. This month, the Hamilton Project updates its jobs blog analysis with a new interactive feature that allows readers to calculate how long the jobs gap will take to close under different rates of job creation. This interactive feature is available by [clicking here](#).

As of April, our nation faces a jobs gap of 11.2 million jobs. The solid line shows the net number of jobs lost since the Great Recession began. The broken lines track how long it will take to close the jobs gap under alternative assumptions about the rate of job creation going forward.



If the economy adds about 208,000 jobs per month, which was the average monthly rate for the best year of job creation in the 2000s, then it will take until March 2020—or eight years—to close the jobs gap. Given a more optimistic rate of 321,000 jobs per month, which was the average monthly rate for the best year of job creation in the 1990s, the economy will reach pre-recession employment levels by June 2016—not for another four years. To see how long the jobs gap will take to close at other rates of job creation, [click here](#).

CONCLUSION

In the aftermath of the Great Recession, the economic recovery has been slow and many American workers remain unemployed. Amidst concerns about how immigrants affect the labor market and economic activity, immigration remains a hotly debated issue by policymakers, but it is necessary to ground the debate in facts. This was the impetus for The Hamilton Project's 2010 document, [Ten Economic Facts About Immigration](#).

On May 15, The Hamilton Project will continue to explore the challenges and opportunities for immigration reform in today's political and economic climate. In addition to a panel discussion around Giovanni Peri's new proposal, a roundtable of thought leaders will discuss many of the broader issues surrounding today's immigration reform debate, including former U.S. Senator Chuck Hagel (R-NE), Silver Lake Co-Founder Glenn Hutchins, National Council of La Raza President and CEO Janet Murguía, and UNITE HERE President John Wilhelm. For more information or to register for the event, [click here](#).

EXHIBIT 13

Working to find actionable solutions to the nation's key challenges.


[SUPPORT](#)
[SUBSCRIBE](#)
[ISSUE AREAS](#)
[MENU](#)

Immigration and the Labor Force

BY KENNETH MEGAN

Tuesday, August 25, 2015

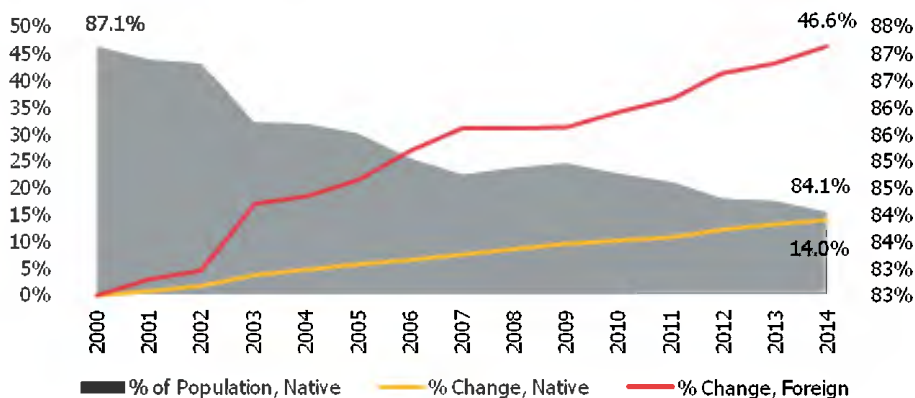
The 2016 presidential campaign has brought immigration back into the spotlight, with candidates crafting messages and policies to address this important issue—particularly as it relates to job creation. In particular, there has been a growing narrative that high levels of immigration have led to declining employment and labor force participation among the native-born population. This has led some to advocate for a more restrictive federal immigration policy.

Though compelling, this argument is overly simplistic and ultimately flawed, as it fails to consider the many factors that influence labor force participation *besides* immigration. Native-born Americans are far more likely to exit the workforce to enroll in school, retire or enter disability, and these factors have driven the decline in employment and labor force participation over the past 15 years—not immigration.¹

Population and Labor Force Trends

The foreign-born population in the United States has been growing at a far faster rate than the native-born population. While the native-born population is seven times larger than the foreign-born population, between 2000 and 2014 the number of foreign-born adults increased by almost 50 percent, compared to just a 14 percent increase for the native adult population. This caused the native-born share of the total adult population to decrease from around 87 percent to 84 percent.

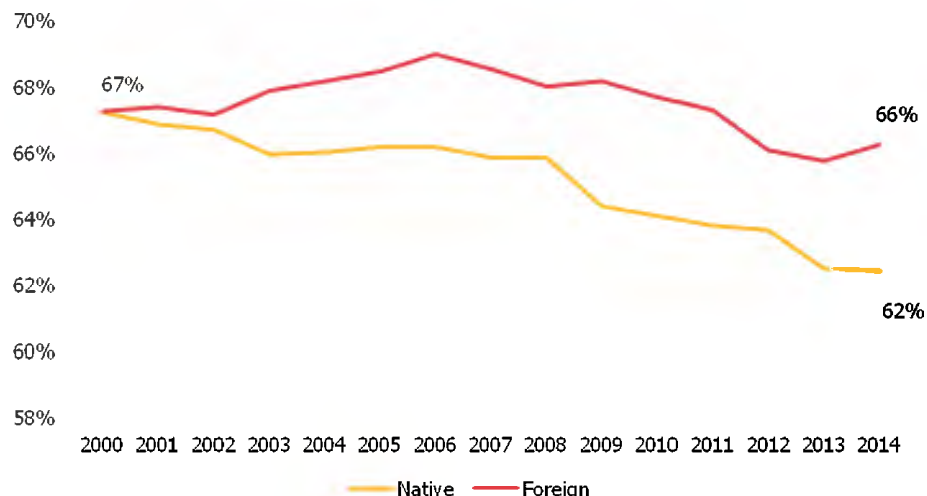
Percent of Population that is Native Born and Percent
Change in Native and Foreign Born Population,
Age 16 and Older, 2000 to 2014



BIPARTISAN POLICY CENTER

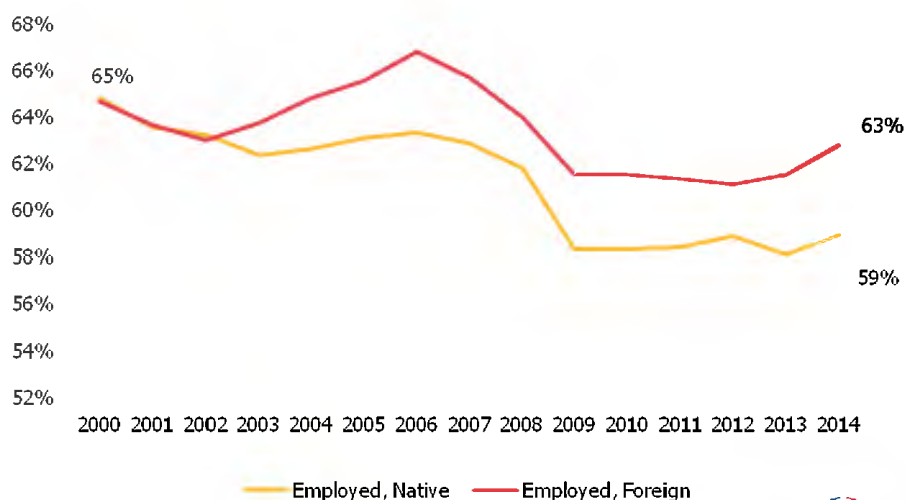
The labor force participation rate² has also been on a downward trend among the native adult population. Between 2000 and 2014, native-born individuals realized a 5 percentage point drop in the labor force participation rate, from 67 to 62 percent, while the foreign-born labor force participation rate decreased by just 1 percentage point, from 67 to 66 percent. Similarly, the native-born employment rate³ declined by 6 percentage points over this period, from 65 percent to 59 percent. Among foreign-born individuals, employment dropped by just 2 percentage points, from 65 percent to 63 percent.

Labor Force Participation Rate, 16 and Older



BIPARTISAN POLICY CENTER

Percent Employed, 16 and Older



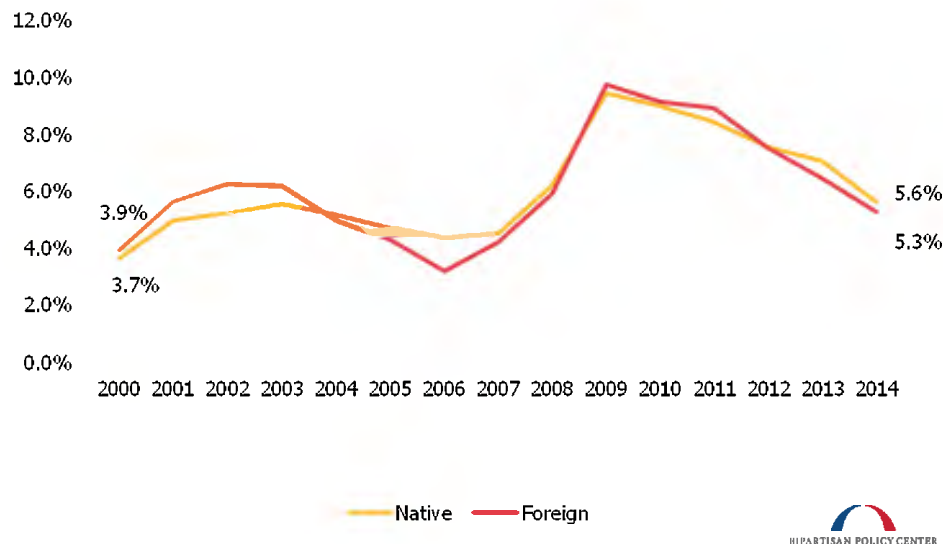
BIPARTISAN POLICY CENTER

From the above charts, it is easy to sympathize with the belief that immigration has forced native-born Americans out of the labor market. Under this theory, a glut of foreign workers has decreased the number of available jobs; native-born individuals have suffered the brunt of this trend, plagued with declining levels of employment and labor force participation.

However, despite its superficial appeal, this conclusion is extremely problematic for two reasons:

Unemployment Rate Parity. The past several years have seen almost no divergence in foreign- and native-born unemployment rates;⁴ the two have remained almost identical since 2000, varying by no more than a few tenths of a percentage point. In 2000, native-born unemployment stood at 3.7 percent, compared to 3.9 percent for foreign-born. By 2014, native-born unemployment had increased to 5.6 percent, compared to 5.3 percent for foreign-born. If immigration were the root cause of declining native-born employment, one would certainly expect the foreign-born population to have a significantly lower unemployment rate than native-born.

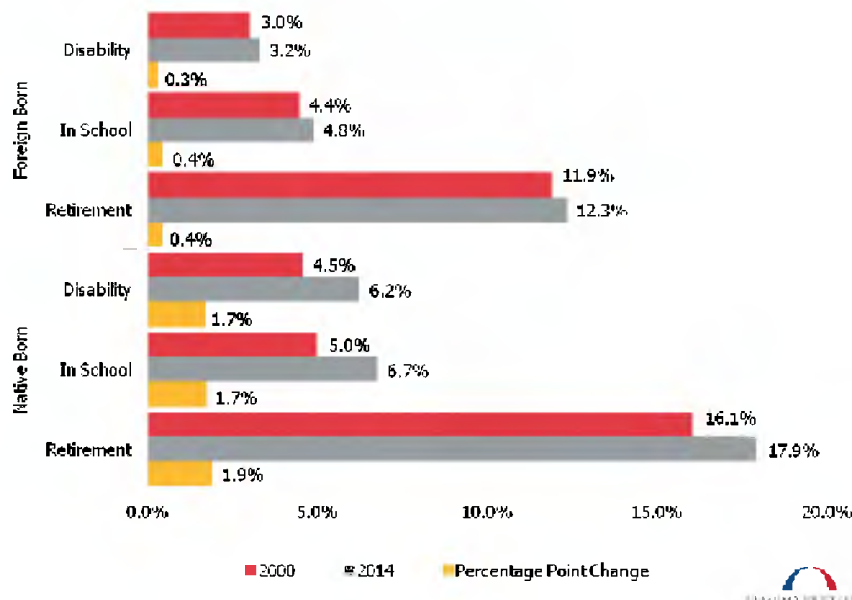
Unemployment Rate, 16 and Older, 2000-2014



Lump of Labor Fallacy. Blaming immigration for declining employment ultimately rests on the flawed belief that economies can only produce a fixed number of jobs and that for every job occupied by an immigrant, a native-born worker must be unemployed. Known as the “lump of labor fallacy,” this assumption has been discredited by a large body of economic research. In fact, textbook economics indicates that immigration can actually spur job creation, as population growth boosts aggregate demand, leading to economic growth and employment opportunities. According to Adam Looney of the [Brookings Institution](#), “Immigrants and U.S.-born workers generally do not compete for the same jobs; instead, many immigrants complement the work of U.S. employees and increase their productivity.” A [paper](#) by Harry Holzer of Georgetown University echoes this belief, and a study from the San Francisco Federal Reserve Board found [no evidence](#) that immigrants displace U.S. workers.

This evidence ultimately calls into question the notion that immigration is the driving force behind declining native-born employment and labor force participation. Rather, these trends can be largely attributed to individual labor market decisions. Specifically, native-born individuals are far more likely to exit the workforce to enroll in school, retire, or enter disability. Indeed, between 2000 and 2014, both disability and school enrollment increased by 1.7 percentage points among the native-born population, while retirement rose by 1.9 percentage points. Meanwhile, these factors barely budged for the foreign-born population—rising by less than a half of a percentage point for each.

Percent of Population Enrolled in School, in Retirement, and on Disability, 16 and Older, 2000 and 2014



At the heart of these trends lies the fact that native-born individuals generally have a greater amount of options than the foreign-born population with regard to their labor market decisions. Immigrant families have lower median incomes, and are more likely to be living below the poverty line—thus they are less likely to have the means to enroll in college. Immigrants also tend to have lower levels of retirement savings. And undocumented immigrants—which comprise around 28 percent of the foreign born population—are unable to qualify for Social Security Disability Insurance. As such, native-born adults have far more flexibility to exit the workforce in favor of retirement, schooling or disability, which puts downward pressure on native employment and labor force participation, regardless of the presence of immigrants.

Contrary to campaign rhetoric, there is no clear evidence that immigration has brought forth a decline in native-born employment or labor force participation. There has been very little divergence in the native born and foreign born unemployment rates, and a breadth of research indicates that immigration can be complementary to native born employment, as it spurs demand for goods and services. What is ultimately behind the downward trend is the fact that native-born Americans are more likely to have the option to exit the labor market—to attend school, enter retirement, or collect disability insurance. The immigrant population often lacks this flexibility, which has led to higher labor force participation among the foreign-born population.

¹ This blog uses data from the US Census Bureau's October Current Population Survey from 2000 to 2014. The October Supplement is when the CPS surveys education enrollment. All data is for the population age 16 to 90.

² Defined as the percentage of the population that is either employed or actively seeking work.

³ Defined as the percent of the adult population (age 16 and older) that is employed.

⁴ The unemployment rate is the percentage of individuals who do not hold a job—but are actively seeking one.

KEYWORDS: [2016](#), [IMMIGRATION AND LABOR FORCE SERIES](#)

RELATED STORIES

To Modernize Legal Immigration System, Get Better Technology and Data

Theresa Cardinal Brown
July 24, 2015

Assembling the Pieces: The Economics of Step-by-Step Immigration Reform

May 21, 2015

The Economics of Step-by-Step Immigration Reform

May 21, 2015

First 100 Days: Immigration and the 114th Congress

Lazaro Zamora
April 15, 2015

0 Comments **Bipartisan Policy Center**

 Login

 Recommend  Share

Sort by Best



Start the discussion...

LOG IN WITH

OR SIGN UP WITH DISQUS 

Name

Be the first to comment.

EXHIBIT 14



CGD Brief April 2013



Temporary Work Visas: A Four-Way Win for the Middle Class, Low-Skill Workers, Border Security, and Migrants

Michael A. Clemens and Lant Pritchett

Low-skill workers from abroad have built the US economy, while seizing opportunity for themselves and their families, since before 1776. Their work grew the US economy and created most of the middle-class and low-skill jobs that exist today.

This has not changed. To continue creating jobs, the economy needs new low-skill workers now more than ever, and that requires a legal channel for the large-scale, employment-based entry of low-skill workers. The lack of such a channel results in a giant black market in unauthorized labor that hobbles US job creation, while directly undermining US border security.

There is a better way—a policy win for everyone involved. *Everyone*. A well-designed temporary work visa program (also referred to as “guest worker program”) could create well-regulated opportunities for foreign workers to fill low-skill positions in the US. Designed correctly, a temporary

visa program can be good for the US middle class, good for US low-skill workers, good for border security, and good for foreign workers.

Temporary Workers Create Good Jobs for the American Middle Class

Major reforms to the US immigration system happen rarely (the last was in 1986), so policymakers must consider the economy’s employment needs not just now, but 10 and 20 years from now. While unemployment is currently high, most economists agree this is due to weak macroeconomic recovery from the 2008 crisis. The workers filling new jobs in the coming decade will be the workers who propel the recovery. What jobs will these be, and who can fill them?

We start from the standard projections by the Bureau of Labor Statistics (BLS) on

Michael Clemens is a senior fellow at the Center for Global Development.
@m_clem

Lant Pritchett is a senior fellow at the Center for Global Development.



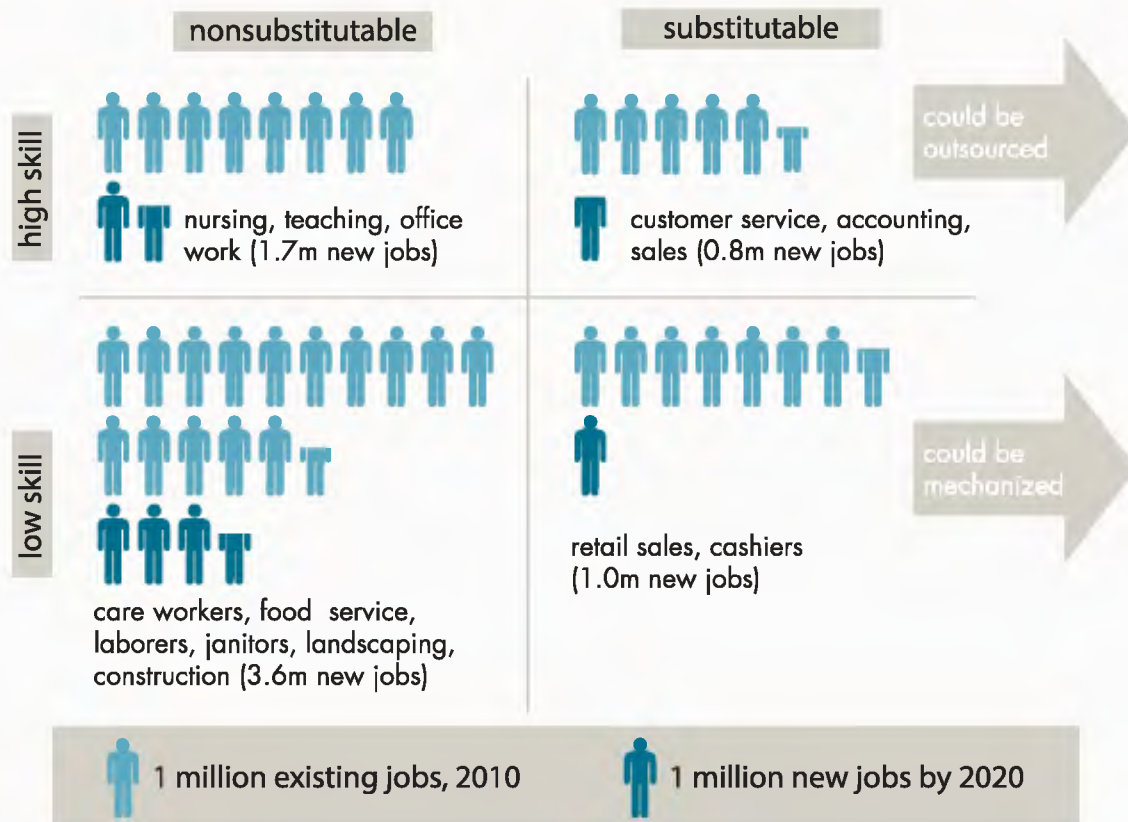
bit.ly/Y8ICad



Summary

The US economy needs low-skill workers now more than ever, and that requires a legal channel for the large-scale, employment-based entry of low-skill workers. The alternative is what the country has now: a giant black market in unauthorized labor that hinders job creation and harms border security. A legal time-bound labor-access program could benefit the American middle class and low-skill workers, improve US border security, and create opportunities for foreign workers.

Figure 1. Most New US Jobs Will Be in Low-Skill Work That Cannot Be Offshored or Mechanized, but Fewer and Fewer Americans Want Them



Source: Bureau of Labor Statistics, "Occupational Outlook Handbook: Projections Overview," www.bls.gov/ooh/about/projections-overview.htm

the current level and expected growth in jobs by occupation. We use a method Lant Pritchett first employed in his 2006 book *Let Their People Come* to divide the service sector in two ways. The first division is between high skill and low skill. The second division is between substitutable jobs that can be lost to offshoring or to machines and what we call hard-core nonsubstitutable service jobs (see figure 1). These jobs require face-to-face contact and nonroutine actions.¹

¹ Lant Pritchett, *Let Their People Come: Breaking the Gridlock on Global Labor Mobility* (Washington: Center for Global Development, 2006).

High-skill nonsubstitutable jobs

Start with the jobs that are *high-skill* and *hard-core nonsubstitutable*: nurses, teachers, policemen, university professors. These are good jobs that Americans want. The BLS projects a gain of 1.7 million jobs like these over the coming decade. The good news is that there will be enough such jobs for every new American worker to be added to the labor force over the next decade. As Mitra Toossi of the Bureau of Labor Statistics projects in the January 2012 edition of the *Monthly Labor Review*,

The US economy will need more new low-skill workers in the personal-care industry alone than the number of new American workers who will enter the entire labor force by 2020.

there will be about 1.7 million new American workers aged 25 to 54 in the coming decade.²

Low-skill nonsubstitutable jobs

Now consider the jobs that are *low-skill* and *hard-core nonsubstitutable*: home health aides, nursing aides, food service workers, janitors. The BLS projects that the US economy will need an additional 3.6 million people to work in these jobs. This figure does not include the additional 1.8 million jobs in the substitutable sectors, such as retail sales and customer service.

Who is going to fill those jobs? They are not typically the jobs American want as the basis of their long-term career prospects. In many sectors,

2. Mitra Toossi, "Labor Force Projections to 2020: A More Slowly Growing Workforce," *Monthly Labor Review* 135(1):43–64, table 1.

Figure 2. The Need for Care Workers Alone Will Outstrip Growth in Entire Labor Force

Number of Americans age 25–54 entering labor force by 2020 (1,679,000 total)



Number of new care jobs by 2020 (1,877,300 total)



Sources: Mitra Toossi, "Labor Force Projections to 2020: A More Slowly Growing Workforce," *Monthly Labor Review* (Bureau of Labor Statistics) 135(1):43–64; Bureau of Labor Statistics, "Occupational Outlook Handbook: Projections Overview," www.bls.gov/ooh/about/projections-overview.htm

employers—including individual families—find a shortage of available workers. And without workers, these sectors cannot grow or generate all the other jobs they create.

For example, take just the low-skill jobs in the care industry—not doctors and nurses, but home health-care aides, nurses' aides, personal-care aides, and child-care providers. The BLS projects there will be more jobs added in just those four occupations (1.9 million) than the total increase in the 25–54 labor force of 1.7 million (see figure 2).

The American middle class is going to thrive by upgrading the skills of the labor force to take high-skill positions such as nurses, doctors, and teachers. Those jobs can exist only with complementary low-skill jobs in the same, nonsubstitutable sectors: nurse practitioners *require* health aides, teachers *require* janitors. But as the so-called sandwich generation—those who care for elderly parents and for their own children—grows and the baby-boomers age there will be an increasing need for care workers to keep high-skill Americans in the labor force. That is the need that a well-designed program for temporary workers can meet.

Temporary Workers Create Low-Skill Jobs for Americans Too—More Jobs, Better Jobs

A well-designed time-bound labor-access program also creates more opportunity for low-skill American workers by sustaining the sectors that employ them. This might seem counterintuitive as many people think and talk about jobs as if they were sandwiches—if he eats it I don't, and when it's eaten it's gone. But the effect of an additional worker on the number of jobs in any economy depends on the balance between what economists call displacement effects (*Did a foreign worker*

The lesson of 1986's regularization: without a well-regulated, lawful way for the US economy to get the future low-skill workers it needs, the black market for labor will grow.

take a job a native would have taken?) and multiplier effects (*Did the foreign worker create other jobs for natives?*).

Economists have studied this balance for decades, and there is a rock-solid consensus among all serious researchers that *existing* migration (both authorized and unauthorized workers) has almost exactly offsetting displacement and multiplier effects on the US economy. No matter how economists slice the data, they find the net impact of existing migration flows on wages and employment of average Americans is close to zero.³

Economists differ only in the question of whether many decades of mostly permanent immigration, authorized or not, have caused a few percentage points' difference up or down in the wages of average US workers. These few percentage points are negligible compared to other forces that have shaped US workers' real wages over recent decades—technological change, economic crises, college education, real-estate markets, international trade, and others. This bears repeating: not one leading labor economist finds that the cumulative immigration of authorized and unauthorized workers over recent decades—and it has been substantial—has been a quantitatively important determinant of average US workers' wages.

How can economists conclusively show that a much greater supply of labor has only tiny effects or no average effect on US workers' wages? Doesn't simple logic suggest that if there is more of something, its price must go down? The reason is the multiplier effects: new workers have a positive effect on the economy and, hence, on the demand for labor, leading to more jobs for everyone.

3. Gordon H. Hanson, "The Economic Consequences of the International Migration of Labor," *Annual Review of Economics* 1(1):179–208.

The multiplier effects happen in four ways:

1. **Migrants spend some part of their income in America and stimulate additional demand here.** Migrants are sellers of their own labor; they are also consumers of the produce of other workers' labor.
2. **Firms and farms that employ foreign workers keep entire industries alive, and those industries employ many US workers.** For example, large portions of US agriculture—apples, cucumbers, sweet potatoes, lettuce, melons, and many other crops—would cease to exist without labor for fieldwork. That means that fieldworkers expand the whole US economy by the value of those industries, and that creates US jobs in all sectors. Often the real option for American industry is not foreign workers versus American workers, but foreign workers versus having no industry at all.
3. **Foreign workers often do not displace other workers in the labor force but rather "home" work or chores—often performed by women—that displace time that could be spent in employment.** Estimates from around the world suggest that access to care workers and, more generally, home workers increases participation in the labor force and hours of more highly skilled native workers. Having help at home allows women to "lean in" to their careers.⁴

4. See Michael Kremer and Stanley Watt, "The Globalization of Household Production," Harvard University Dept. of Economics Working Paper (2009);); Patricia Cortés and José Tessada, "Low-skilled Immigration and the Labor Supply of Highly Skilled Women," *American Economic Journal: Applied Economics* 3(3):88–123; and Patricia Cortés and Jessica Pan, "Outsourcing Household Production: The Demand for Foreign Domestic

Figure 3. Without Lawful Worker Programs, the Black Market for Labor Will Likely Grow Again

Estimated number of unauthorized resident aliens (millions)



Source: Ruth Ellen Wasem, "Unauthorized Aliens Residing in the United States: Estimates Since 1986," CRS Report for Congress RL33872 (2012).

- 4. Having foreign workers in low-skill jobs sustains the need for management positions, creating good jobs that Americans want.** Many low-skill workers are being displaced by machines (for retail check-out, airline check-in, automated pay for parking, and so on), along with the first-line managers who supervise them. Having more low-skill workers in low-skill jobs creates more career-path management jobs (front-line and middle) in a way that machines do not.

The same multipliers take hold in temporary visa programs. And careful design can make them even larger: a good program can direct workers to industries that would otherwise attract few Americans. Even the chaotic, largely black-market way that these jobs have been filled in recent years has led to multiplier effects that completely or almost completely offset the displacement effects. Larger multipliers under a well-regulated program can more than offset displacement effects—with *positive* net impacts on American jobs and wages.

Temporary Worker Programs Help to Secure American Borders

The choice is not between having foreign workers fill jobs and not having them fill jobs. The choice is between laws that fuel US economic growth and job creation and laws that starve the US economy, while creating vast and potentially dangerous black markets for the labor the economy needs.

The country has been at this crossroads before, and it took a wrong turn. The last major immigration reform, in 1986, failed to create new channels for authorized temporary labor. Lawmakers thought it would be enough to regularize many of the 3 million unauthorized workers then in the country and step up border enforcement.

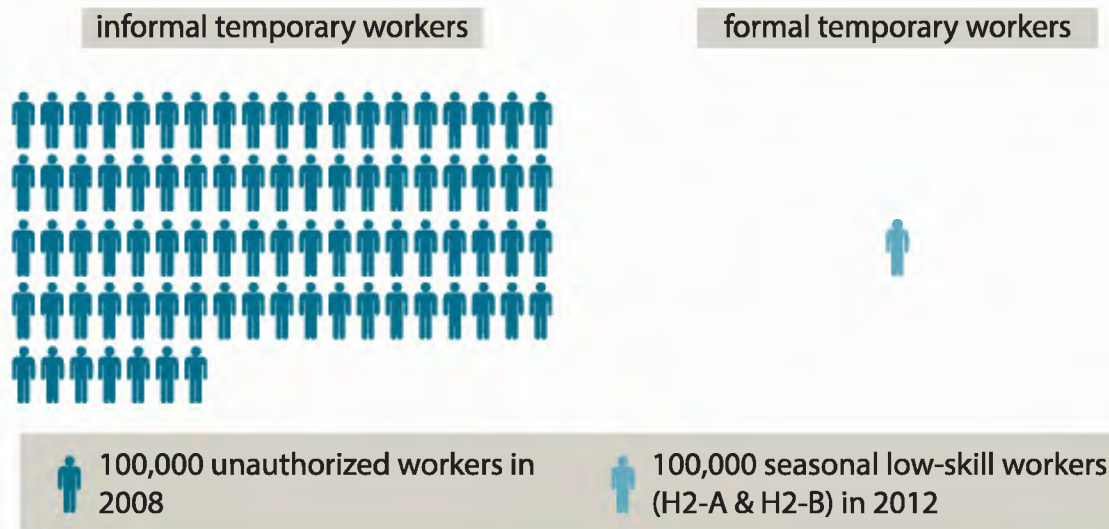
What happened was clear—and dramatic. The US economy continued to need low-skill foreign workers to grow, and within a few years all the regularized workers were replaced with new unauthorized workers. A few years after that, there were many more—and eventually 9 million more—unauthorized workers than before the regularization that myopically and spectacularly failed to solve the problem (see figure 3).

It is often argued that a "guest worker" program is politically unacceptable, but that is not quite right. Many prosperous countries—such as New Zealand, Singapore, and Kuwait—operate large-scale *formal* programs for temporary workers. But America's is by far the world's largest—and wackiest—guest-worker scheme. The United States has far more low-skill foreign workers than Singapore or Kuwait but forces its employers to rely on the black market (see figure 4).

Acknowledging that not everyone who is allowed to work in the United States is automatically on a path to citizenship is part of the political difficulty. Giving all migrants the chance to eventually become legal permanent residents or citizens would be ideal, and one compromise would be to give some low-skill temporary migrants an opportunity to adjust their status and become permanent residents. But, whether opportunities for adjustment of status are available or not, the real alternative to a formal program for low-skill workers is a labor shortage or a black market.

Helpers and Native Labor Supply in Hong Kong," *Journal of Labor Economics* (forthcoming).

Figure 4. The World's Wackiest Guest Worker Program—The United States Relies on Informal Workers to Meet Demand for Low-Skill Labor



Sources: Jeffrey Passel and D'Vera Cohn, "A Portrait of Immigrants in the United States," PewResearch Hispanic Center, April 4, 2009, www.pewhispanic.org/2009/04/14/a-portrait-of-unauthorized-immigrants-in-the-united-states. US Department of State, Nonimmigrant Visa Issuances by Visa Class and by Nationality data, available at http://travel.state.gov/visa/statistics/nivstats/nivstats_4582.html

So far, the United States has simply eliminated most legal options for the economy to get the low-skill labor it needs and has thereby created a black-market guest-work "program." This does not reduce the number of workers. It simply pushes guest work out of the scope of regulatory enforcement, leaving foreign workers at risk of abuse and exploitation, American workers without protection, employers without legal recourse, and Americans divided about border security. One cannot secure the border exclusively at the border; security requires enforcement, but enforcement requires meeting legitimate needs in legitimate ways.

The experiences of many other countries around the world show that it is possible to enforce regulations of temporary low-skilled worker programs in ways that benefit everyone involved.

Temporary Worker Visas Give Foreign Workers the Opportunity of a Lifetime

The opportunity to work productively is the best and surest way to help families in the rest of the world escape poverty. In a 2008 paper, we and Claudio Montenegro compare wages of equivalent workers between the United States and 42 other countries.⁵ For instance, we measure the wages of a low-skill 35-year-old male born and educated in Peru and compare how his wages would change if he moved from Peru to the United States.

That single move to the United States can change his economic prospects much more than nearly anything else he could do. The typical hourly wage for this person in the United States was \$9.74; in Peru it was \$2.57 (adjusted for the fact that prices are cheaper in Peru). Even making

5. Michael Clemens, Claudio E. Montenegro, and Lant Pritchett, "The Place Premium: Wage Differences for Identical Workers across the US Border," CGD Working Paper 148 (Washington: Center for Global Development, 2008).

Low-skill wages in the United States are the economic opportunity of a lifetime for workers from around the world.

generous adjustments for selectivity (that those who mover might be intrinsically more productive than those who don't), we find that the typical low-skill male worker from a developing country could increase his income by a factor of four—about \$15,000 per year—by working in the United States (see figure 5).

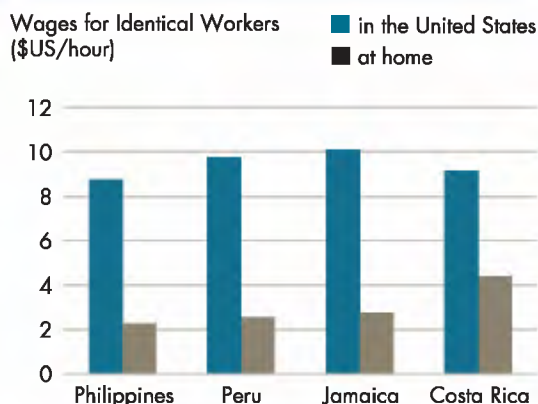
A worker's family back home also benefits massively from his or her work in the United States. Economists have carried out rigorous evaluations of the effects of overseas work on households around the world, including in the Pacific and East Asia.⁶ Temporary overseas work raises their buy-

ing power, helps them get out of debt, improves their housing, and helps their children get more and better schooling. Of course, workers' families would prefer there to be good job opportunities in their home countries, but for most, those opportunities just do not yet exist.

While some assert that temporary worker programs exploit foreign workers, the opposite is true. Suggesting that temporary foreign workers are cheap labor is exactly backwards; their labor is cheap at home where it is trapped in a less productive environment but made much more valuable by a legal temporary worker program than by any other real option they have. Of all rigorously evaluated programs to increase incomes in poor countries (education, microfinance, health interventions, business training) the gains from labor mobility are the largest *by a factor of ten*—and the most cost effective (as they pay for themselves). Of course, there are abuses, and workers need protection from exploitation by traffickers or employers—but a well-designed legal program can do that much better than the existing black markets.

While the gains to foreign workers are not uppermost in the minds of American politicians considering immigration reform, it is important to emphasize the fundamental fact that migrants would benefit massively from access to the US labor market—even if only in specific occupations and on a temporary basis.

Figure 5. US Wages Are the Economic Opportunity of a Lifetime for Foreign Workers



Source: Michael Clemens, Claudio Montenegro, and Lant Pritchett, "The Place Premium: Wage Differences for Identical Workers across the US Border," CGD Working Paper 148 (Washington: Center for Global Development, 2008).

6. Pacific: John Gibson and David McKenzie, "The Development Impact of a Best Practice Seasonal Worker Policy," Policy Research Working Paper 5488 (Washington: World Bank, 2010). East Asia: Dean Yang, "International Migration, Remittances, and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks," *Economic Journal* 118:591–630; Michael A. Clemens and Erwin R. Tiongson, "Split Decisions: Family Finance When a Policy Discontinuity Allocates Overseas Work," Policy Research Working Paper 6287 (Washington: World Bank, 2012).

Conclusion

The immigration reform debate must consider what is best for the American middle class, American low-skill workers, American border security, and foreigners who hope to work in the United States. A well-designed time-bound labor program for low-skill workers is essential to achieving the best outcome on all four of these fronts. The economic benefits of allowing US firms to access the labor



Michael Clemens is a senior fellow at the Center for Global Development.

[@m_clem](#)

Lant Pritchett is a senior fellow at the Center for Global Development.

they need will support the American middle class and create more job opportunities for American workers. Replacing our informal system with a legal program will improve border security and ensure that the rights of migrants seeking economic opportunities are fully protected. Time-bound access to low-skill labor is critical to a sustainable, productive immigration system.

Michael Clemens is a senior fellow at the Center for Global Development, where he leads the Migration and Development initiative. His research focuses on the effects of international migration on people from and in developing countries. Clemens has served as an affiliated associate professor

of public policy at Georgetown University and a visiting scholar at New York University. He is the recipient of the 2012 Royal Economic Society Prize.

Lant Pritchett is a senior fellow at the Center for Global Development and professor of the practice of international development at Harvard's Kennedy School of Government. He was previously lead socio-economist in the social development group of the South Asia region of the World Bank. He has published two books with the Center for Global Development, *Let Their People Come* (2006) and *The Rebirth of Education* (forthcoming).

Related Publications

Let Their People Come: Breaking the Gridlock on Global Labor Mobility by Lant Pritchett (2006), www.cgdev.org/publication/let-their-people-come.

"The Place Premium: Wage Differences for Identical Workers across the US Border" by Michael Clemens, Claudio E. Montenegro, and Lant Pritchett, CGD Working Paper 148, www.cgdev.org/publication/place-premium.

"Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?" by Michael Clemens, CGD Working Paper 264, www.cgdev.org/publication/economics-and-emigration.

"Income per Natural: Measuring Development As If People Mattered More Than Places" by Michael Clemens, CGD Working Paper 143, www.cgdev.org/publication/income-per-natural.

"Split Decisions: Family Finance When a Policy Discontinuity Allocates Overseas Work" by Michael Clemens and Erwin Tiongson, World Bank Policy Research Working Paper 6287, elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-6287



1800 Massachusetts Ave NW
Third Floor
Washington DC 20036
202-416-4000

www.cgdev.org

This work is made available under the terms of the Creative Commons Attribution-NonCommercial 3.0 license.

The Center for Global Development is grateful to its funders and board of directors for support of this work.

EXHIBIT 15

"



Our site uses cookies to deliver relevant messages during your visit, such as presenting our latest offers and allowing easier access for subscribers. To receive the best experience, please allow cookies. View our [cookie policy](#) or [manage your cookies](#).

Allow

**The
Economist**
[World politics](#) [Business & finance](#) [Economics](#) [Science & technology](#) [Culture](#) [Blogs](#) [Debate](#) [Multimedia](#) [Print edition](#)

Economics A-Z terms beginning with L

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Labour	LBO	Liquidity
Labour intensive	Leading indicators	Liquidity preference
Labour market flexibility	Lender of last resort	Liquidity trap
Labour theory of value	Leverage	Lock-in
Laffer curve	Leveraged buy-out	Long run
Lagging indicators	Liberal economics	Lump of labour fallacy
Laissez-faire	Liberalisation	Lump-sum tax
Land	LIBOR	Luxuries
Land tax	Life	
Law and economics	Life-cycle hypothesis	

Labour

One of the [FACTORS OF PRODUCTION](#), with [LAND](#), [CAPITAL](#) and [ENTERPRISE](#). Among the things that determine the supply of labour are the number of able people in the [POPULATION](#), their willingness to work, labour laws and regulations, and the health of the economy and [FIRMS](#). [DEMAND](#) for labour is also affected by the health of the economy and firms, labour laws and regulations, as well as the [PRICE](#) and supply of other factors of production.

In a perfect market, [WAGES](#) (the price of labour) would be determined by [SUPPLY](#) and demand. But the labour market is often far from perfect. Wages can be less flexible than other prices; in particular, they rarely fall even when demand for labour declines or supply increases. This wage rigidity can be a cause of [UNEMPLOYMENT](#).

Labour intensive

A production process that involves comparatively large amounts of [LABOUR](#); the opposite of [CAPITAL INTENSIVE](#).

Labour market flexibility

Essential Economics



Economics A-Z is adapted from "Essential Economics", by [Matthew Bishop](#) - Bloomberg Press; Economist Books.

Buy it at [Amazon.com](#) or [Amazon.co.uk](#)

Advertisement

Ad



Follow *The Economist*

A flexible LABOUR market is one in which it is easy and inexpensive for FIRMS to vary the amount of labour they use, including by changing the hours worked by each employee and by changing the number of employees. This often means minimal REGULATION of the terms of employment (no MINIMUM WAGE, say) and weak (or no) trade UNIONS. Such flexibility is characterised by its opponents as giving firms all the power, allowing them to fire employees at a moment's notice and leaving workers feeling insecure.

Opponents of labour market flexibility claim that labour laws that make workers feel more secure encourage employees to invest in acquiring skills that enable them to do their current job better but that could not be taken with them to another firm if they were let go. Supporters claim that it improves economic EFFICIENCY by leaving it to MARKET FORCES to decide the terms of employment. Broadly speaking, the evidence is that greater flexibility is associated with lower rates of UNEMPLOYMENT and higher GDP per head.

Labour theory of value

The notion that the value of any good or service depends on how much LABOUR it uses up. First suggested by ADAM SMITH, it took a central place in the philosophy of KARL MARX. Some neo-classical economists disagreed with this theory, arguing that the PRICE of something was independent of how much labour went into producing it and was instead determined solely by SUPPLY and DEMAND.

Laffer curve

Legend has it that in November 1974 Arthur Laffer, a young economist, drew a curve on a napkin in a Washington bar, linking AVERAGE tax rates to total tax revenue. Initially, higher tax rates would increase revenue, but at some point further increases in tax rates would cause revenue to fall, for instance by discouraging people from working. The curve became an icon of supply-side ECONOMICS. Some economists said that it proved that most governments could raise more revenue by cutting tax rates, an argument that was often cited in the 1980s by the tax-cutting governments of Ronald Reagan and Margaret Thatcher. Other economists reckoned that most countries were still at a point on the curve at which raising tax rates would increase revenue. The lack of empirical evidence meant that nobody could really be sure where the United States and other countries were on the Laffer curve. However, after the Reagan administration cut tax rates revenue fell at first. American tax rates were already low compared with some countries, especially in continental Europe, and it remains possible that these countries are at a point on the Laffer curve where cutting tax rates would pay.

Lagging Indicators

Old news. Some economic statistics move weeks or months after changes in the BUSINESS CYCLE or INFLATION. They may not be a reliable guide to the current state of an economy or its future path. Contrast with LEADING INDICATORS.

Laissez-faire

Let-it-be ECONOMICS: the belief that an economy functions best when there is no interference by GOVERNMENT. It can be traced to the 18th-century French physiocrats, who believed in government according to the natural order and opposed MERCANTILISM. ADAM SMITH and others turned it into a central tenet of CLASSICAL ECONOMICS, as it allowed the INVISIBLE HAND to operate efficiently. (But even they saw a need for some limited government role in the economy.) In the 19th century, it inspired the British political movement that secured the repeal of the Corn Laws and promoted FREE TRADE, and gave birth to *The Economist* in 1843. In the 20th century, laissez-faire was often seen as synonymous with supporting MONOPOLY and allowing the BUSINESS CYCLE to boom and bust, and it came off second best against KEYNESIAN policies of interventionist government. However, mounting evidence of the inefficiency of state intervention inspired

the free market policies of Ronald Reagan and Margaret Thatcher in the 1980s, both of

Most commented

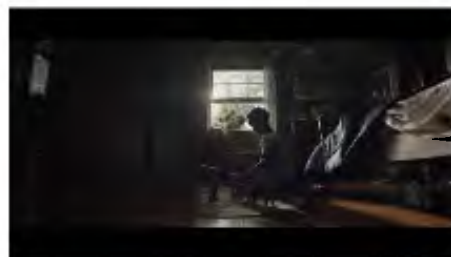


1
The Helsinki summit
The missing middle of the Trump-Putin meeting

- 2** **Voting reform:** American democracy's built-in bias towards rural Republicans
- 3** **America under attack:** Robert Mueller indicts twelve Russians
- 4** **Open Future:** Europe's civil war of sovereignty is tearing its soul apart
- 5** **Open Future:** Why the world should adopt a basic income

Advertisement

Ad



Products and events

Test your EQ

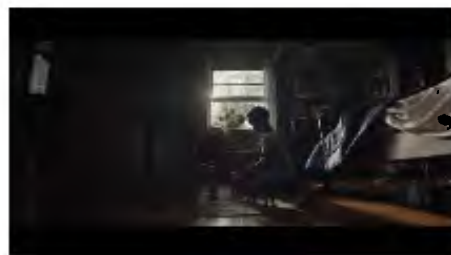
Take our weekly news quiz to stay on top of the headlines

Want more from *The Economist*?

Visit The Economist e-store and you'll find a range of carefully selected products for business and pleasure, Economist books and diaries, and much more

Advertisement

Ad



whom stressed the importance of laissez-faire.

Land

One of the FACTORS OF PRODUCTION, along with LABOUR, CAPITAL and ENTERPRISE. Pending colonisation of the moon, it is in fairly fixed SUPPLY. Marginal increases are possible by reclaiming land from the sea and cutting down forests (which may impose large economic costs by damaging the environment), but the expansion of deserts may slightly reduce the amount of usable land. Owners earn MONEY from land by charging RENT.

Land tax

Henry George, a 19th-century American economist, believed that taxes should be levied only on the value of LAND, not on LABOUR or CAPITAL. This 'single tax', he asserted in his book, *PROGRESS AND POVERTY*, would end UNEMPLOYMENT, POVERTY, INFLATION and INEQUALITY. Many countries levy some tax on land or property values, although George's single tax has never been fully implemented. This is mainly because of fears that it would drive down land PRICES too much or discourage efforts to improve the quality (that is, the economic value) of land. George addressed this concern by arguing that the tax should be levied only against the value of 'unimproved' land. Certainly, a land tax has obvious advantages: it is simple and cheap to levy; evasion is all but impossible; and it penalises owners who do not put their land to work.

Law and economics

Laws can be an important source of economic EFFICIENCY - or inefficiency. Early economists such as ADAM SMITH often wrote about the economic impact of legal matters. But ECONOMICS subsequently focused more narrowly on things monetary and commercial. It was only in the 1940s and 1950s, at the University of Chicago Law School, that the discipline of law and economics was born. It is now a substantial branch of economics and has had an impact beyond the ivory towers.

The "economics" of law and economics is firmly in the LIBERAL ECONOMICS camp, favouring free markets and arguing that REGULATION often does more harm than good. It stresses the economic value of having clear, enforceable PROPERTY RIGHTS, and of ensuring that these can be bought and sold. It has encouraged many ANTITRUST policy-makers to focus on maximising consumer WELFARE, rather than, say, protecting small FIRMS or opposing big ones just because they are big. It has also ventured into broader sociological issues, for instance, analysing the economic causes of criminality and how to structure legal incentives to reduce crime. (See also EVOLUTIONARY ECONOMICS.)

LBO

See LEVERAGED BUY-OUT.

Leading indicators

Economic crystal balls. Also known as cyclical indicators, these are groups of statistics that point to the future direction of the economy and the BUSINESS CYCLE. Certain economic variables, fairly consistently, precede changes in GDP and certain others precede changes in INFLATION. In some countries, statisticians combine the various different leading indicators into an overall leading index of economic GROWTH or inflation. However, there is not necessarily any causal relationship between the leading indicators and what they are predicting, which is why, like other crystal balls, they are fallible. Contrast with LAGGING INDICATORS.

Lender of last resort

One of the main functions of a CENTRAL BANK. When financially troubled BANKS need cash and nobody else will lend to them, a central bank may do so, perhaps with strings attached, or even by taking control of the troubled bank, closing it or finding it a new owner.

This role of the central bank makes CREDIT CREATION easier by increasing confidence in the banking system and minimising the RISK of a bank run by reassuring depositors that their MONEY is safe. However, it also creates a potential MORAL HAZARD: that banks will lend more recklessly because they know they will be bailed out if things go wrong.

Leverage

See GEARING.

Leveraged buy-out

Buying a company using borrowed MONEY to pay most of the purchase PRICE. The DEBT is secured against the ASSETS of the company being acquired. The INTEREST will be paid out of the company's future cashflow. Leveraged buy-outs (LBOs) became popular in the United States during the 1980s, as public DEBT markets grew rapidly and opened up to borrowers that would not previously have been able to raise loans worth millions of dollars to pursue what was often an unwilling target. Although some LBOs ended up with the borrower going bust, in most cases the need to meet demanding interest bills drove the new managers to run the firm more efficiently than their predecessors. For this reason, some economists see LBOs as a way of tackling AGENCY COSTS associated with corporate governance.

Liberal economics

LAISSEZ-FAIRE CAPITALISM by another name.

Liberalisation

A policy of promoting LIBERAL ECONOMICS by limiting the role of GOVERNMENT to the things it can do to help the market economy work efficiently. This can include PRIVATISATION and DEREGULATION.

LIBOR

Short for London interbank offered rate, the rate of INTEREST that top-quality BANKS charge each other for loans. As a result, it is often used by banks as a base for calculating the INTEREST RATE they charge on other loans. LIBOR is a floating rate, changing all the time.

Life

Human life is priceless. But this has not stopped economists trying to put a financial value on it. One reason is to help FIRMS and policymakers to make better decisions on how much to spend on costly safety measures designed to reduce the loss of life. Another is to help insurers and courts judge how much compensation to pay in the event of, say, a fatal accident.

One way to value a life is to calculate a person's HUMAN CAPITAL by working out how much he or she would earn were they to survive to a ripe old age. This could result in very different sums being paid to victims of the same accident. After an air crash, probably more MONEY would go to the family of a first-class passenger than to that of someone flying economy. This may not seem fair. Nor would using this method to decide what to spend on safety measures, as it would mean much higher expenditure on avoiding the death of, say, an investment banker than on saving the life of a teacher or coal miner. It would also imply spending more on safety measures for young people and being positively reckless with the lives of retired people.

Another approach is to analyse the risks that people are voluntarily willing to take, and how much they require to be paid for taking them. Taking into account differences in WAGES for high death-risk and low death-risk jobs, and allowing for differences in education, experience, and so on, it is possible to calculate roughly what value people put on their own

lives. In industrialised countries, most studies using this method come up with a value of

\$5m-10m.

Life-cycle hypothesis

An attempt to explain the way that people split their INCOME between spending and saving, and the way that they borrow. Over their lifetime, a typical person's income varies by far more than how much they spend. On AVERAGE, young people have low incomes but big spending commitments: on investing in their HUMAN CAPITAL through education and training, building a family, buying a home, and so on. So they do not save much and often borrow heavily. As they get older their income generally rises, they pay off their mortgage, the children leave home and they prepare for retirement, so they sharply increase their saving and INVESTMENT. In retirement, their income is largely or entirely from state benefits and the saving and investment they did when working; they spend most or all of their income, and, by selling off ASSETS, often spend more than their income.

Broadly speaking, this theory is supported by the data, though some economists argue that young people do not spend as much as they should on, say, being educated, because lenders are reluctant to extend CREDIT to them. One puzzle is that people often have substantial assets left when they die. Some economists say this is because they want to leave a generous inheritance for their relatives; others say that people are simply far too optimistic about how long they will live. (See also PERMANENT INCOME HYPOTHESIS and RELATIVE INCOME HYPOTHESIS.)

Liquidity

How easily an ASSET can be spent, if so desired. Cash is wholly liquid. The liquidity of other assets is usually less; how much less may be measured by the ease with which they can be exchanged for cash (that is, liquidated). Public FINANCIAL MARKETS try to maximise the liquidity of assets such as BONDS and EQUITIES by providing a central meeting place (the exchange) in which would-be buyers and sellers can easily find each other. Financial market makers (middlemen such as investment BANKS) can also increase liquidity by using some of their CAPITAL to buy SECURITIES from those who want to sell, when there is no other buyer offering a decent PRICE. They do this in the expectation that if they hold the asset for a while they will be able to find somebody to buy it. Typically, the higher the volume of trades happening in a marketplace, the greater is its liquidity. Moreover, highly liquid markets attract more liquidity-seeking traders, further increasing liquidity. In a similar way, there can be vicious cycles in which liquidity dries up. The amount of liquidity in financial markets can vary enormously from one moment to the next, and can sometimes evaporate entirely, especially if market makers become too RISK AVERSE to put their capital at risk in this way.

Liquidity preference

The proportion of their ASSETS that FIRMS and individuals choose to hold in varying degrees of LIQUIDITY. The more cash they have, the greater is their desire for liquidity.

Liquidity trap

When MONETARY POLICY becomes impotent. Cutting the rate of INTEREST is supposed to be the escape route from economic RECESSION: boosting the MONEY SUPPLY, increasing DEMAND and thus reducing UNEMPLOYMENT. But KEYNES argued that sometimes cutting the rate of interest, even to zero, would not help. People, BANKS and FIRMS could become so RISK AVERSE that they preferred the LIQUIDITY of cash to offering CREDIT or using the credit that is on offer. In such circumstances, the economy would be trapped in recession, despite the best efforts of monetary policymakers.

KEYNESIANS reckon that in the 1930s the economies of both the United States and the UK were caught in a liquidity trap. In the late 1990s, the Japanese economy suffered a similar fate. But MONETARISM has no place for liquidity traps. Monetarists pin the blame for the Great DEPRESSION and Japan's more recent troubles on other factors and reckon that ways could have been found to make monetary policy work.

Lock-in

See PATH DEPENDENCE.

Long run

When we are all dead, according to KEYNES. Unimpressed by the thrust of CLASSICAL ECONOMICS, which said that economies have a long-run tendency to settle in EQUILIBRIUM at FULL EMPLOYMENT, he wanted economists to try to explain why in the short run economies are so often in DISEQUILIBRIUM, or in equilibrium at high levels of UNEMPLOYMENT.

Lump of labour fallacy

One of the best-known fallacies in ECONOMICS is the notion that there is a fixed amount of work to be done - a lump of LABOUR - which can be shared out in different ways to create fewer or more jobs. For instance, suppose that everybody worked 10% fewer hours. FIRMS would need to hire more workers. Hey presto, UNEMPLOYMENT would shrink.

In 1891, an economist, D.F. Schloss, described such thinking as the lump of labour fallacy because, in reality, the amount of work to be done is not fixed. GOVERNMENT-imposed restrictions on the amount of work people may do can actually reduce the EFFICIENCY of the labour market, thereby increasing UNEMPLOYMENT. Shorter hours will create more jobs only if weekly pay is also cut (which workers are likely to resist) otherwise costs per unit of output will rise. Not all labour costs vary with the number of hours worked. FIXED COSTS, such as recruitment and training, can be substantial, so it will cost a firm more to hire two part-time workers than one full-timer. Thus a cut in the working week may raise AVERAGE costs per unit of OUTPUT and cause firms to buy fewer total hours of labour. A better way to reduce unemployment may be to stimulate DEMAND and so increase output; another is to make the labour market more flexible, not less.

Lump-sum tax

A tax that is the same amount for everybody, regardless of INCOME or wealth. Some economists argue that this is the most efficient form of TAXATION, as it does not distort incentives and thus it has no DEADWEIGHT COST. This is because each person knows that whatever they do they will have to pay the same amount. It is also cheap to administer, as there is no complex process of measuring each person's INCOME and ASSETS in order to calculate their tax bill. However, because rich and poor people pay the same, the tax may be perceived as unfair - as Margaret Thatcher found out when she introduced a lump-sum 'poll tax', a decision that was later to play a large part in her ousting as British prime minister.

Luxuries

Goods and SERVICES that have a high ELASTICITY of DEMAND. When the PRICE of, say, a Caribbean holiday rises, the number of vacations demanded falls sharply. Likewise, demand for Caribbean holidays rises significantly as AVERAGE INCOME increases, certainly by more than demand for many NORMAL GOODS. Contrast this with necessities, such as milk or bread, which people usually demand in quite similar quantities whatever their income and whatever the price.

[Back to top](#)

Classified ads



Contact us

Help

My account

Subscribe

Print edition

Digital editions

Events

Jobs.Economist.com

Timekeeper saved articles

Sections

United States
Britain
Europe
China
Asia
Americas
Middle East & Africa
International
Business & finance
Economics
Markets & data
Science & technology
Special reports
Culture
Multimedia library

Debate and discussion

The Economist debates
Letters to the editor
The Economist Quiz

Blogs

Bagehot's notebook
Buttonwood's notebook
Democracy in America
Erasmus
Free exchange
Game theory
Graphic detail
Gulliver
Prospero
The Economist explains

Research and insights

Topics
Economics A-Z
The World in 2016
Which MBA?
MBA Services
The Economist GMAT Tutor
The Economist GRE Tutor
Executive Education Navigator
Reprints and permissions

The Economist Group »

The Economist Intelligence Unit
The Economist Intelligence Unit Store
The Economist Corporate Network
Ideas People Media
1843 Magazine
Roll Call
CQ
EuroFinance
The Economist Store
Editorial Staff
Modern Slavery Statement

[View complete site index »](#)

[Contact us](#) [Help](#) [About us](#) [Advertise with us](#) [Staff Books](#) [Careers](#) [Site index](#)

Copyright © The Economist Newspaper Limited 2018. All rights reserved. [Modern Slavery Statement](#) [Accessibility](#) [Privacy policy](#) [Cookies info](#) [Terms of use](#)

EXHIBIT 16

The New York Times

Opinion

Lumps of Labor

By PAUL KRUGMAN OCT. 7, 2003

Economists call it the "lump of labor fallacy." It's the idea that there is a fixed amount of work to be done in the world, so any increase in the amount each worker can produce reduces the number of available jobs. (A famous example: those dire warnings in the 1950's that automation would lead to mass unemployment.) As the derisive name suggests, it's an idea economists view with contempt, yet the fallacy makes a comeback whenever the economy is sluggish.

Sure enough, the lump-of-labor fallacy has resurfaced in the United States -- but with a twist. Traditionally, it is a fallacy of the economically naïve left -- for example, four years ago France's Socialist government tried to create more jobs by reducing the length of the workweek. But in America today you're more likely to hear lump-of-labor arguments from the right, as an excuse for the Bush administration's policy failures.

The latest lump-of-labor revival came to my attention when I realized how eagerly certain commentators were picking up on a new study by economists at the Federal Reserve Bank of New York. In it, Erica Groshen and Simon Potter argue that the pattern of laying off workers during recessions and rehiring them during recoveries has changed: since 1990 employers have become much less likely to rehire

2

ARTICLES
REMAINING

But I was puzzled at first by the enthusiasm with which a relatively academic paper was seized upon by usually bullish, supposedly hardheaded business commentators. The puzzle vanished, however, when I read these remarks more carefully: they were mainly trying to make excuses for the administration's dismal job record. You see, they say, it's not that an economic policy consisting largely of tax cuts for the rich has failed to deliver. No, it's a structural problem with the economy, which just happens to have arisen now, and nobody could have done better.

Oh, well. But partisan politics aside, the growing lumpishness of American thinking about jobs is dangerous, in two ways.

First, it encourages fatalism -- if politicians and the public believe that new jobs can't be created, they will stop pressuring our leaders to find more effective policies. And that would be a shame, since the Bush administration has resolutely refused to try the policies most likely to improve the employment picture.

Since 2001, sensible economists have been pleading for federal aid to state and local governments so schoolteachers and police officers needn't be laid off because of a temporary fall in revenues. They've also urged the administration to stop dragging its heels on much-needed homeland security spending, not just because such spending is needed to make the country safer, but also because it would create jobs and put more income into the hands of Americans likely to spend it. (And if you're worried about spending's leading to increased deficits, why not cancel some of those long-run tax breaks for upper brackets?) Until we've done the obvious things, there's no reason to despair about job creation.

Second, lump-of-labor thinking -- and the policy paralysis it encourages -- feeds protectionism. If the public no longer believes that the economy can create new jobs, it will demand that we protect old jobs from new competitors in China and elsewhere. Economists can explain until they are blue in the face why limiting exports from developing countries would be a bad idea -- why keeping our markets open to new producers is in America's interest both economically and diplomatically. But theoretical arguments for free trade will count for little if the real-world

History seems to be repeating itself: a similar rush to blame foreigners for U.S. problems happened during Bush I's jobless recovery (which looked like a hiring boom compared with recent experience). Remember the president's literally nauseating trip to Japan in the company of auto executives? But if the early 1990's flirtation with protectionism had the feeling of farce, today's employment stagnation -- and the protectionist talk now emanating from both parties -- has the makings of tragedy. If we don't get some real job creation soon, the politics of jobs may become dangerously self-destructive.

E-mail: krugman@nytimes.com

© 2018 The New York Times Company

EXHIBIT 17

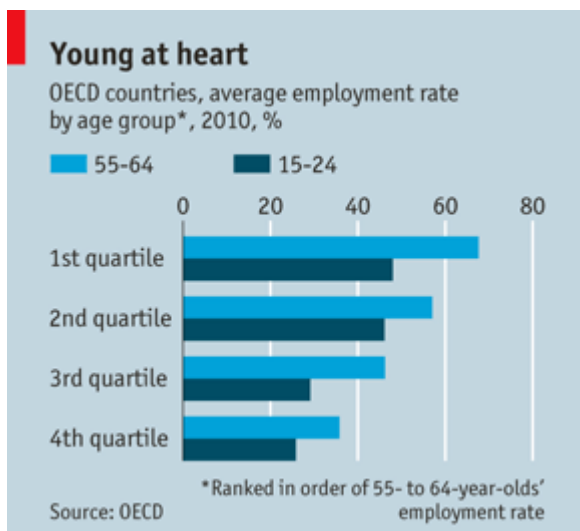
The Economist

Buttonwood Keep on trucking

Why the old should not make way for the young

Print edition | Finance and economics

Feb 11th 2012



WORK until you drop. That is how many people characterise the argument of those—this newspaper included—who call for a later retirement age. Life expectancy may be steadily increasing but few are eager to add to their years of toil. Indeed, the French Socialist Party wants to reverse a recent rise in the retirement age from 60 to 62.

In part, this resistance to working longer is because people tend to feel they are entitled to put their feet up after a career of 35-40 years. But it is also because many reckon old people should get out of the way so that the young can take their jobs, a sentiment expressed recently by Lucy Kellaway, a *Financial Times* columnist, who wrote that “the young can’t advance because everywhere they find my complacent generation is in situ.”

Economists will recognise the flaw in this logic. This view is based on the “lump of labour” fallacy that states there is only so much work to go around. The same argument was used to discourage women from joining the workforce; and the threat to domestic jobs is still used by anti-immigrant politicians today.

The problem with the lump-of-labour fallacy is that it is so hard to kill. It appears to be common sense. Most people know an older manager (or columnist) who refuses to make way for a younger, more energetic rival.

In the face of intuition and anecdotal evidence, it is always good to look at the data. The chart shows employment levels in the mostly rich OECD countries among the oldest section of the workforce (55-64) and the youngest (15-24). The countries are divided into four quartiles, and ranked in order of the employment rate of the grey-haired contingent.

If the lump-of-labour argument were correct, you would expect to see that a high employment rate among the wrinklies would be offset by a low employment rate among the youngsters, and vice versa. Not a bit of it. High elderly employment rates are associated with high youth employment.

One possible counter-argument is that this correlation may simply show that different economies are at different stages of the cycle: when an economy is growing strongly, employment rates for both the old and the young are likely to be high. But that is a hard point to sustain, given that the past few years have seen a worldwide recession and modest recovery. Most of the economies that have been growing bouncily (such as China) are not in the OECD.

So why don't the oldies keep the youngsters out of jobs? For the same reason that women don't keep men out of jobs. When people work for a living, they earn money. They spend that money on goods and services that are produced by other people, young and old, male and female.

Job patterns change, too. Once nearly everybody worked on the farm. But the advent of tractors and combine harvesters did not lead to permanent unemployment. People found jobs, first in manufacturing and then in services. The elderly may not be doing the same jobs in their 60s as they were in their 30s.

Perhaps none of the above arguments (or data) convinces you. So consider a thought experiment. If old people leave the workforce early, they become dependent on young people for their living. This is obviously the case with those on state benefits. But it is also true for those with private pension funds: these consist of equities and bonds which depend on workers to generate the income needed to pay dividends and interest.

Indeed, one reason that corporate-pension funds are in deficit is that they have been raided on so many occasions to fund early-retirement programmes. This was a classic case of a false economy. The wage bill went down in the short term but the pension costs went up in the long term. Companies assumed they could make good on these long-term promises because they hoped future investment returns on their pension funds would be as good as they were in the 1980s and 1990s.

What is true at the corporate level is also true in aggregate. People assume they can afford long retirements because economic growth will continue. But growth depends on having either more workers or greater productivity. A society cannot really be more prosperous if it pays more and more of its citizens not to work.

If early retirement really improves living standards, why stop at 60? Why not 55? If governments moved the retirement age down to 40 every young person would have a job and everyone would be living in the lap of luxury. Alas, the land of the lotus-eaters remains a myth. Get back to the office.

Economist.com/blogs/buttonwood

EXHIBIT 18

FRBSF ECONOMIC LETTER

2010-26

August 30, 2010

The Effect of Immigrants on U.S. Employment and Productivity

BY GIOVANNI PERI

The effects of immigration on the total output and income of the U.S. economy can be studied by comparing output per worker and employment in states that have had large immigrant inflows with data from states that have few new foreign-born workers. Statistical analysis of state-level data shows that immigrants expand the economy's productive capacity by stimulating investment and promoting specialization. This produces efficiency gains and boosts income per worker. At the same time, evidence is scant that immigrants diminish the employment opportunities of U.S.-born workers.

Immigration in recent decades has significantly increased the presence of foreign-born workers in the United States. The impact of these immigrants on the U.S. economy is hotly debated. Some stories in the popular press suggest that immigrants diminish the job opportunities of workers born in the United States. Others portray immigrants as filling essential jobs that are shunned by other workers. Economists who have analyzed local labor markets have mostly failed to find large effects of immigrants on employment and wages of U.S.-born workers (see Borjas 2006; Card 2001, 2007, 2009; and Card and Lewis 2007).

This *Economic Letter* summarizes recent research by Peri (2009) and Peri and Sparber (2009) examining the impact of immigrants on the broader U.S. economy. These studies systematically analyze how immigrants affect total output, income per worker, and employment in the short and long run. Consistent with previous research, the analysis finds no significant effect of immigration on net job growth for U.S.-born workers in these time horizons. This suggests that the economy absorbs immigrants by expanding job opportunities rather than by displacing workers born in the United States. Second, at the state level, the presence of immigrants is associated with increased output per worker. This effect emerges in the medium to long run as businesses adjust their physical capital, that is, equipment and structures, to take advantage of the labor supplied by new immigrants. However, in the short run, when businesses have not fully adjusted their productive capacity, immigrants reduce the capital intensity of the economy. Finally, immigration is associated with an increase in average hours per worker and a reduction in skills per worker as measured by the share of college-educated workers in a state. These two effects have opposite and roughly equal effect on labor productivity.

The method

A major challenge to immigration research is the difficulty of identifying the effects of immigration on economic variables when we do not observe what would have happened if immigration levels had been different, all else being equal. To get around this problem, we take advantage of the fact that the increase

in immigrants has been very uneven across states. For example, in California, one worker in three was foreign born in 2008, while in West Virginia the comparable proportion was only one in 100. By exploiting variations in the inflows of immigrants across states at 10-year intervals from 1960 to 2000, and annually from 1994 to 2008, we are able to estimate the short-run (one to two years), medium-run (four years), and long-run (seven to ten years) impact of immigrants on output, income, and employment.

To ensure that we are isolating the effects of immigrants rather than effects of other factors, we control for a range of variables that might contribute to differences in economic outcomes. These include sector specialization, research spending, openness to trade, technology adoption, and others. We then compare economic outcomes in states that experienced increases in immigrant inflows with states that did not experience significant increases.

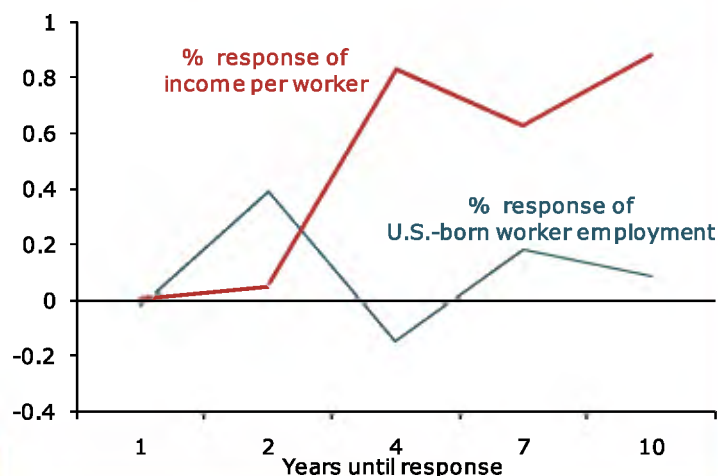
As a further control for isolating the specific effects of immigration, we focus on variations in the flow of immigrants that are caused by geographical and historical factors and are not the result of state-specific economic conditions. For example, a state may experience rapid growth, which attracts a lot of immigrants and also affects output, income, and employment. In terms of geography, proximity to the Mexican border is associated with high net immigration because border states tend to get more immigrants. Historical migration patterns also are a factor because immigrants are drawn to areas with established immigrant communities. These geography and history-driven flows increase the presence of immigrants, but do not reflect state-specific economic conditions. Hence, economic outcomes associated with these flows are purer measures of the impact of immigrants on economic variables.

The short- and the long-run effects of immigrants

Immigration effects on employment, income, and productivity vary by occupation, job, and industry. Nonetheless, it is possible to total these effects to get an aggregate economic impact. Here we attempt to quantify the aggregate gains and losses for the U.S. economy from immigration. If the average impact on employment and income per worker is positive, this implies an aggregate “surplus” from immigration. In other words, the total gains accruing to some U.S.-born workers are larger than the total losses suffered by others.

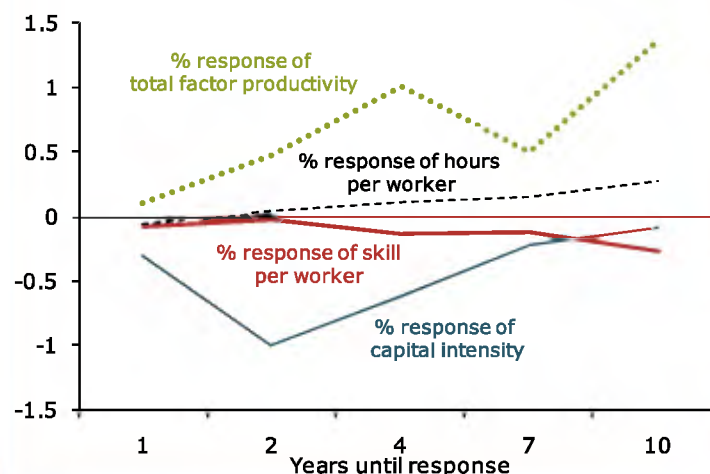
Figures 1 and 2 show the response of key economic variables to an inflow of immigrants equal to 1% of employment. Figure 1 shows the impact on employment of U.S.-born workers and on average income per worker after one, two, four, seven, and ten years. Figure 2 shows the impact on the components of income per worker: physical capital intensity, as measured by capital per unit of output; skill intensity, as measured by human capital per worker; average hours worked; and total factor productivity, measuring productive efficiency and technological level. Some interesting patterns emerge.

Figure 1
Employment and income



First, there is no evidence that immigrants crowd out U.S.-born workers in either the short or long run. Data on U.S.-born worker employment imply small effects, with estimates never statistically different from zero. The impact on hours per worker is similar. We observe insignificant effects in the short run and a small but significant positive effect in the long run. At the same time, immigration reduces somewhat the skill intensity of workers in the short and long run because immigrants have a slightly lower average education level than U.S.-born workers.

Figure 2
Capital intensity, hours per worker, and total factor productivity



Second, the positive long-run effect on income per U.S.-born worker accrues over some time. In the short run, small insignificant effects are observed. Over the long run, however, a net inflow of immigrants equal to 1% of employment increases income per worker by 0.6% to 0.9%. This implies that total immigration to the United States from 1990 to 2007 was associated with a 6.6% to 9.9% increase in real income per worker. That equals an increase of about \$5,100 in the yearly income of the average U.S. worker in constant 2005 dollars. Such a gain equals 20% to 25% of the total real increase in average yearly income per worker registered in the United States between 1990 and 2007.

The third result is that the long-run increase in income per worker associated with immigrants is mainly due to increases in the efficiency and productivity of state economies. This effect becomes apparent in the medium to long run. Such a gradual response of productivity is accompanied by a gradual response of capital intensity. While in the short run, physical capital per unit of output is decreased by net immigration, in the medium to long run, businesses expand their equipment and physical plant proportionally to their increase in production.

How can these patterns be explained?

The effects identified above can be explained by adjustments businesses make over time that allow them to take full advantage of the new immigrant labor supply. These adjustments, including upgrading and expanding capital stock, provide businesses with opportunities to expand in response to hiring immigrants.

This process can be analyzed at the state level (see Peri and Sparber 2009). The analysis begins with the well-documented phenomenon that U.S.-born workers and immigrants tend to take different occupations. Among less-educated workers, those born in the United States tend to have jobs in manufacturing or mining, while immigrants tend to have jobs in personal services and agriculture. Among more-educated workers, those born in the United States tend to work as managers, teachers, and nurses, while immigrants tend to work as engineers, scientists, and doctors. Second, within industries and specific businesses, immigrants and U.S.-born workers tend to specialize in different job tasks. Because those born in the United States have relatively better English language skills, they tend to specialize in communication tasks. Immigrants tend to specialize in other tasks, such as manual labor.

Just as in the standard concept of comparative advantage, this results in specialization and improved production efficiency.

If these patterns are driving the differences across states, then in states where immigration has been heavy, U.S.-born workers with less education should have shifted toward more communication-intensive jobs. Figure 3 shows exactly this. The share of immigrants among the less educated is strongly correlated with the extent of U.S.-born worker specialization in communication tasks. Each point in the graph represents a U.S. state in 2005. In states with a heavy concentration of less-educated immigrants, U.S.-born workers have migrated toward more communication-intensive occupations. Those jobs pay higher wages than manual jobs, so such a mechanism has stimulated the productivity of workers born in the United States and generated new employment opportunities.

To better understand this mechanism, it is useful to consider the following

hypothetical illustration. As young immigrants with low schooling levels take manually intensive construction jobs, the construction companies that employ them have opportunities to expand. This increases the demand for construction supervisors, coordinators, designers, and so on. Those are occupations with greater communication intensity and are typically staffed by U.S.-born workers who have moved away from manual construction jobs. This complementary task specialization typically pushes U.S.-born workers toward better-paying jobs, enhances the efficiency of production, and creates jobs. This task specialization, however, may involve adoption of different techniques or managerial procedures and the renovation or replacement of capital equipment. Hence, it takes some years to be fully realized.

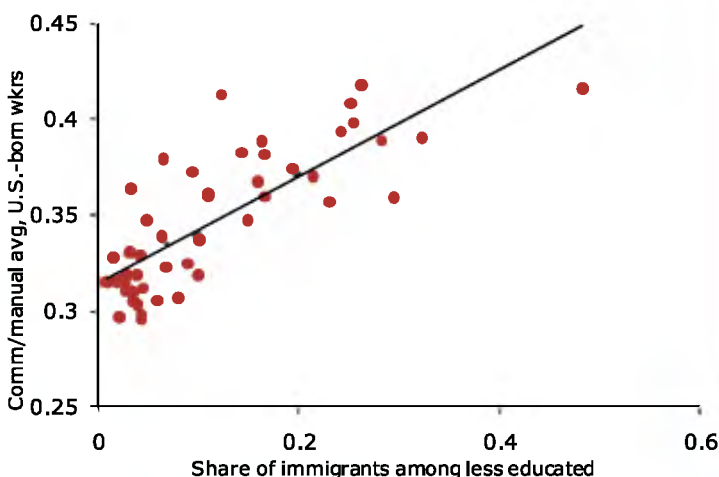
Conclusions

The U.S. economy is dynamic, shedding and creating hundreds of thousands of jobs every month. Businesses are in a continuous state of flux. The most accurate way to gauge the net impact of immigration on such an economy is to analyze the effects dynamically over time. Data show that, on net, immigrants expand the U.S. economy's productive capacity, stimulate investment, and promote specialization that in the long run boosts productivity. Consistent with previous research, there is no evidence that these effects take place at the expense of jobs for workers born in the United States.

Giovanni Peri is an associate professor at the University of California, Davis, and a visiting scholar at the Federal Reserve Bank of San Francisco.

Figure 3

Communication/manual skills among less-educated workers



Note: The data on average communication/manual skills by state are from Peri and Sparber (2009), obtained from the manual and communication intensity of occupations, weighted according to the distributional occupation of U.S.-born workers.

References

- Borjas, George J. 2006. "Native Internal Migration and the Labor Market Impact of Immigration." *Journal of Human Resources* 41(2), pp. 221–258.
- Card, David. 2001. "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration." *Journal of Labor Economics* 19(1), pp. 22–64.
- Card, David. 2007. "How Immigration Affects U.S. Cities." University College London, Centre for Research and Analysis of Migration Discussion Paper 11/07.
http://www.econ.ucl.ac.uk/cream/pages/CDP/CDP_11_07.pdf
- Card, David. 2009. "Immigration and Inequality." *American Economic Review, Papers and Proceedings* 99(2), pp. 1–21.
- Card, David, and Ethan Lewis. 2007. "The Diffusion of Mexican Immigrants during the 1990s: Explanations and Impacts." In *Mexican Immigration to the United States*, ed. George J. Borjas. Chicago: The University of Chicago Press.
- Peri, Giovanni. 2009. "The Effect of Immigration on Productivity: Evidence from U.S. States." NBER Working Paper 15507. www.nber.org/papers/w15507
- Peri, Giovanni, and Chad Sparber. 2009. "Task Specialization, Immigration, and Wages." *American Economic Journal: Applied Economics* 1(3), pp. 135–169.

Recent issues of *FRBSF Economic Letter* are available at

<http://www.frbsf.org/publications/economics/letter/>

2010-25	Financial Market Imperfections and Macroeconomics: Conference Summary http://www.frbsf.org/publications/economics/letter/2010/el2010-25.html	Swanson
2010-24	Future Recession Risks http://www.frbsf.org/publications/economics/letter/2010/el2010-24.html	Berge / Jordà
2010-23	Stock-Market-Based Measures of Sectoral Shocks and the Unemployment Rate http://www.frbsf.org/publications/economics/letter/2010/el2010-23.html	Chehal / Loungani / Trehan
2010-22	Mortgage Prepayments and Changing Underwriting Standards http://www.frbsf.org/publications/economics/letter/2010/el2010-22.html	Hedberg / Krainer
2010-21	Lifecycle Investment Decisions and Labor Income Risk http://www.frbsf.org/publications/economics/letter/2010/el2010-21.html	Benzoni / Goldstein
2010-20	Fiscal Crises of the States: Causes and Consequences http://www.frbsf.org/publications/economics/letter/2010/el2010-20.html	Gerst / Wilson
2010-19	Challenges in Economic Capital Modeling http://www.frbsf.org/publications/economics/letter/2010/el2010-19.html	Lopez
2010-18	The Fed's Exit Strategy for Monetary Policy http://www.frbsf.org/publications/economics/letter/2010/el2010-18.html	Rudebusch
2010-17	The "Inflation" in Inflation Targeting http://www.frbsf.org/publications/economics/letter/2010/el2010-17.html	Dennis

EXHIBIT 19

COMMENTARY

Five Myths about DACA

By David Bier

This article appeared on Washington Post on September 7, 2017.

The Trump administration's move to rescind the Deferred Action for Childhood Arrivals program, or DACA, has created an uncertain future for the 800,000 young unauthorized immigrants who had been granted protection from deportation and permission to work legally. A six-month delay provides a chance for Congress to save the 2012 program. But if we're going to debate the merits of DACA, we should know what we're talking about. Here are some common myths.

MYTH NO. 1

DACA incentivized an increase in illegal immigration.

House Judiciary Committee Chairman Bob Goodlatte (R-Va.) is among those who support ending DACA because it has “encouraged more illegal immigration and contributed to the surge of unaccompanied minors and families seeking to enter the U.S. illegally.” Statements like this betray a misunderstanding of who is eligible for deportation relief under the program. DACA applies only to immigrants who entered before their 16th birthdays and who have lived in the country continuously since at least June 15, 2007 — more than a decade ago. No one entering now can apply.

Perhaps the chairman thinks that children coming to the border are confused on this point. But the facts don't support that view either. To begin with, the timing is wrong. According to data from the Border Patrol, the increase in migrant children in 2012 — the year President Barack Obama announced DACA — occurred entirely in the months before the president announced the policy. The rate of increase also remained the same in 2013 as it was in 2012. Even

then, the total number of juveniles attempting to cross the border — unaccompanied and otherwise — never returned to the pre-recession levels of the mid-2000s.

Another problem with the theory is that although the majority of DACA beneficiaries are of Mexican origin, the increase in children crossing the border stems from El Salvador, Guatemala and Honduras. These countries share one common trait: much higher than average levels of violence than anywhere else in North America. A careful study of this phenomenon by economist Michael Clemens found that more than anything else, a rise in homicides between 2007 and 2009 set off a chain of events that led to the rise of child migration.

Regardless, overall illegal immigration is far below where it was before the United States' last legalization program, in 1986, when each border agent caught more than 40 border crossers per month. Last year, it was fewer than two per month. DACA had no effect on this trend.

MYTH NO. 2

DACA has taken jobs from Americans.

In announcing the Trump administration's decision this past week, Attorney General Jeff Sessions said that DACA "denied jobs to hundreds of thousands of Americans by allowing those same jobs to go to illegal aliens." This myth even has a name in economics: the lump of labor fallacy. It supposes that the number of jobs in the economy is fixed, and that any increase in workers results in unemployment. Yet this notion is easily disproved. From 1970 to 2017, the U.S. labor force doubled. Rather than ending up with a 50 percent unemployment rate, U.S. employment doubled.

If adding workers made the economy poorer, we might expect that people would try to "free" themselves from competition by moving to a desolate mountain and making everything for themselves. That no one does so is an admission that competition is actually good. We depend on other workers, DACA recipients included, to buy the products and services we produce. That's one reason earlier efforts to restrict immigration did not produce any wage gains.

MYTH NO. 3

Repealing DACA would benefit taxpayers.

Sessions also argued that ending DACA “protects taxpayers.” But the opposite is true. According to the National Academy of Sciences (NAS), first-generation immigrants who enter the United States as children (including all DACA recipients) pay, on average, more in taxes over their lifetimes than they receive in benefits, regardless of their education level. DACA recipients end up contributing more than the average, because they are not eligible for any federal means-tested welfare: cash assistance, food stamps, Medicaid, health-care tax credits or anything else.

They also are better educated than the average immigrant. Applicants must have at least a high school degree to enter the program. An additional 36 percent of DACA recipients who are older than 25 have a bachelor’s degree, and an additional 32 percent are pursuing a bachelor’s degree. The NAS finds that among recent immigrants who entered as children, those with a high school degree are positive to the government, to the tune of \$60,000 to \$153,000 in net present value, meaning it’s like each immigrant cutting a check for that amount at the door. For those with a bachelor’s degree, it’s a net positive of \$160,000 to \$316,000. Each DACA permit canceled is like burning tens of thousands of dollars in Washington.

MYTH NO. 4

DACA repeal protects communities from criminals.

DACA repeal, the attorney general further claimed, “saves lives” and “protects communities.” He implied that DACA “put our nation at risk of crime.” But DACA participants are not criminals. Unauthorized immigrants — the applicant pool for DACA — are much less likely to end up in prison, indicating lower levels of criminality. More important, to participate in DACA, applicants must pass a background check. They have to live here without committing a serious offense. If they are arrested, DACA can be taken away even without a conviction.

Only 2,139 out of almost 800,000 DACA recipients have lost their permits because of criminal or public safety concerns — that's just a quarter of 1 percent. Four times as many U.S.-born Americans are in prison. About 35 times as many Americans have ended up behind bars at some point before age 34.

MYTH NO. 5

DACA repeal is just about politics.

Obama criticized the DACA move this past week as “a political decision” that was “not required legally.” But legal issues certainly factored into the Trump administration's calculation. The timing coincided with a deadline that several states imposed on the administration, stating that if the president did not wind down DACA by Sept. 5, they would sue. If President Trump wanted to end DACA for political reasons, he could have done so on his first day in office.

Obama should know that defending DACA legally could be difficult. After all, when he attempted to implement a similar but much broader program in 2015 for undocumented parents of U.S. citizens, courts shut him down. Obama implemented DACA without going through Congress, and although some legal scholars dispute whether it faces the same legal issues as the 2015 program, the Trump administration would have confronted a real possibility of defeat had it had chosen to defend DACA in court.

The correct response, however — for economic reasons and security reasons, but above all for moral reasons — would have been to actively push for Congress to enact the program, not to announce its demise and leave the chips to fall where they may.



***David Bier** is an immigration policy analyst at the Cato Institute.*

PRINTED FROM CATO.ORG

EXHIBIT 20



Insight

How Immigration Helps U.S. Workers and the Economy

JACQUELINE VARAS | MARCH 20, 2017

The impact of immigration on American workers is an increasingly relevant question. President Trump **argues** that “decades of immigration have produced lower wages and higher unemployment for our citizens.” He **also contends** that low-skilled immigration is responsible for African-American and Hispanic unemployment. **Other** members of the executive branch are equally concerned. Attorney General Jeff Sessions drafted **legislation** just last year which would have reduced high-skilled immigration in order to help American workers.

The president’s claim assumes that immigrant workers increase labor market competition and drive down wages for everyone. Fortunately, this reasoning is misguided.

The number of jobs in the United States **is not fixed**. As the U.S. population and labor force has increased, so has total employment. Therefore, adding foreign workers to the economy does not crowd-out employment for native workers. To the contrary, immigration generates growth and employment opportunities by increasing the total number of people in the United States. A larger population leads to increased consumption levels, higher demand, and more production.

One study from the National Bureau of Economic Research (NBER) found that immigration leads to labor specialization, which increases total factor productivity. This is not surprising: research shows that immigrant and native workers are imperfect substitutes. They gravitate toward different types of jobs due to varying language skills, education levels, and levels of experience. These productivity advances have resulted in income gains for American workers. Specifically, the study found that a 1 percent increase in immigrant employment per state leads to a 0.5 percent increase in income per worker.

Other studies have confirmed the income **benefits of immigration**. While examining high levels of immigration to the United States between 1990 and 2004, **researchers found that** native-born U.S. workers experienced corresponding short-run and long-run increases in wages. Approximately 90 percent of the U.S.-born labor force gained from immigration, while the individuals whose wages were most negatively affected were previous immigrants. Immigration also caused small, negative effects on the wages of U.S.-born workers without a high school degree.

It is not uncommon for U.S. workers with less than a high school education to be somewhat negatively affected by immigration. This is because their skill sets more closely match new immigrants than other workers. However, workers without a high school degree only represent **8 percent** of the U.S. labor force. Improving the availability of job training for all workers, including those **displaced by** immigration, would help to ease these labor market shifts.

Studies into **high-skilled** immigration’s impact on workers and the economy have produced similar results. A recent study **examined** the growth of computer science workers on temporary H-1B visas from 1994 to 2001. It concluded that **high-skilled** immigration lead to the creation of more IT firms in the United States and lowered

prices of IT goods by 1.9 percent to 2.4 percent. This gives consumers a wider variety of options while simultaneously increasing their purchasing power.

The study also found that employment and wages of U.S. computer science workers would have been higher if the government had restricted high-skilled immigration. High-skilled immigration increased the number of individuals competing for computer science occupations, which shifted some U.S. workers to non-computer science fields. However, this shift increased the productivity of non-computer science workers, increased demand for these workers, and consequently boosted their wages.

The consensus of academic literature is that immigration is an overall asset to U.S. economy. This is particularly evident when examining recent analyses by Moody's Analytics of Donald Trump and Hillary Clinton's proposed economic policies. In [President Trump's case](#), removing all undocumented immigrants from the labor force was predicted to trigger an economic recession within one year. This is consistent with previous [American Action Forum research](#), which found that removing undocumented immigrants would reduce GDP by \$380 billion to \$620 billion and create shortages of at least 4 million workers. In [Hillary Clinton's case](#), increasing legal immigration would increase both total employment in the United States and real GDP growth. According to the report, "there is no policy she has proposed that provides a more potent boost to the economy than immigration reform."

Moody's is correct in asserting that increased immigration boosts economic growth. However, immigration is also instrumental in preventing economic decline. Birth rates in the United States have been [below the replacement rate](#), the rate at which a generation can exactly replace itself, since 1971. Without immigration, the U.S. population would shrink. This would cause a corresponding decrease in both the labor force and overall economic activity, which may trigger deflation.

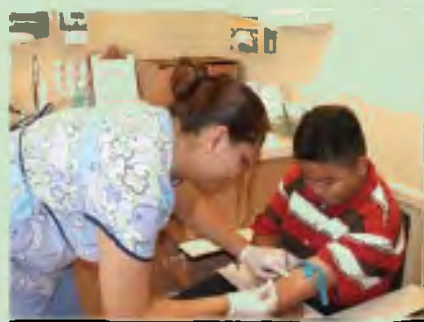
A [draft executive order](#) from the White House states that U.S. immigration policy should "prioritiz(e) the protection of American workers ... and the jobs they hold." It instructs the administration to review current regulations concerning immigrant workers and propose new regulations to "restore the integrity" of employment-based visa programs. Instead of restricting employment-based immigration, the president should recognize its benefits for both U.S. workers and the economy.

EXHIBIT 21



NEBRASKA'S IMMIGRANT POPULATION

ECONOMIC AND FISCAL IMPACTS



UNIVERSITY OF
Nebraska
Omaha

OLLAS



NEBRASKA'S IMMIGRANT POPULATION ECONOMIC AND FISCAL IMPACTS



Prepared by

Christopher S. Decker, Ph.D.
Associate Professor
Department of Economics and Real Estate
College of Business Administration
University of Nebraska at Omaha
Omaha, NE 68182

With assistance from

Jerry Deichert
Director and Senior Research Associate
Center for Public Affairs Research
University of Nebraska at Omaha
Omaha, NE 68182

Lourdes Gouveia
Director of Office of Latino/Latin American Studies
Professor of Sociology
University of Nebraska at Omaha
Omaha, NE 68182

Sponsored by and prepared for

Office of Latino/Latin American Studies
University of Nebraska at Omaha
Omaha, NE 68182

October 12, 2008

The Office of Latino/Latin American Studies (OLLAS, pronounced “oy-yas”) at the University of Nebraska at Omaha is a transnational center located in the College of Arts and Sciences. OLLAS’ mission is to combine academic excellence with real-world engagement in order to contribute to the understanding of Latino/Latin American issues. OLLAS’ main goals are: 1) to develop and implement a policy-oriented and community-relevant research and publication agenda; 2) to create and expand learning spaces beyond the classroom for students, corporate actors, policy-makers and the public at large; and 3) to establish partnerships with community organizations in order to strengthen Latino and Latin American populations’ capacity to exercise their rights to equal and active citizenship within and across borders. Our work is informed by a deep understanding of the dynamic interaction of global and local forces. We are grateful for the support provided by private foundations, government grants, private donors and the University of Nebraska. For more information, visit our website: www.unomaha.edu

The contents of this report were developed under a grant from the U.S. Department of Education; however, it does not necessarily represent DOE policy. The reader should not assume endorsement of this report by the Federal Government.

Acknowledgements

The authors would like to thank Mr. David Drozd at the Center for Public Affairs Research, University of Nebraska at Omaha (UNO). Without his expertise in the use and analysis of U.S. Census data, this report would not have been possible.

We also thank Louis Pol, Dean of the College of Business Administration, University of Nebraska at Omaha, for his invaluable input.

Finally we want to thank Yuriko Doku, OLLAS graduate assistant, who contributed with bibliographic searches and other research-related tasks.

Support for this research was provided in part by a grant from the U.S. Department of Education, the Mammal Foundation Faculty in Residence program and the UNO College of Business Administration.

This publication should be cited as:

Decker, Christopher with Jerry Deichert and Lourdes Gouveia. 2008. *Nebraska's Immigrant Population. Economic and Fiscal Impacts*. OLLAS Special Report No. 5. Omaha, NE: Office of Latino/Latin American Studies (OLLAS), University of Nebraska at Omaha.

Table of Contents

Executive Summary	1
Measuring the Economic Impact of Migration – An Introduction	3
Major Elements and Regional Scope of Impact Study	5
Data Sources and Model Platform Utilized for Immigration Analysis.....	6
Geographic Scope of Impact Study	7
Expenditure Impacts of First-Generation Foreign-Born Immigrants	10
State-Level Impacts	10
Regional Impacts	13
Alternative Expenditure Estimates.....	14
The Impact of the Immigrant Labor Force on State Production	15
State-Level Impacts	15
Regional Impacts	17
Alternative Employment Impact Scenarios	18
Fiscal Contributions and Social Cost Pressures from the Immigrant Population in Nebraska.....	20
Fiscal Contributions	21
Public Costs	22
Conclusion and Future Research	23
Bibliography	27
Appendix A: American Community Survey Public Use Microdata Sample	29
Appendix B: Calculation of After-Tax and Remittances Income	31
Appendix C: Calculations of Public Contributions and Costs Estimates	33
Appendix D: Basic Input-Output (IO) Modeling and Derivation of IO Multipliers.....	35

Executive Summary

Immigration issues have once again assumed center stage in policy circles at every level of government in the United States, as the number of new immigrants, many undocumented and many from Latin American nations, has risen markedly in recent years. This is certainly true in Nebraska. According to US Census figures for 2000, the total immigrant population in Nebraska was estimated to be 74,638. By 2006, this figure had risen to 99,500, a 33.3 percent increase. By comparison, the total native-born population in the state grew less than 2.0 percent over the same six-year period. This study attempts to quantitatively measure the impact of the state's immigrant population on the Nebraska economy, with some attention paid to Latin American immigrant groups. In this summary, a few key findings are highlighted. (See executive summary table).

- In 2006, immigrant spending resulted in \$1.6 billion worth of total production (or output) to Nebraska's economy, with a possible range from \$1.5 to \$1.7 billion. Moreover, this spending generated between 11,874 and 12,121 jobs in total for the state.
- The 2006 total production impact of Central and South American immigrant *spending* was \$717 million, with a possible range between \$653 million and \$792 million, accounting for between 4,923 and 5,971 jobs in the state.
- The total value of production impact of immigrant spending in Nebraska's Omaha and Lincoln areas was \$1.14 billion in 2006, resulting in 8,331 jobs. The impact of immigrant spending on total production in Nebraska's Eastern region (excluding the Omaha and Lincoln areas) was \$204 million, resulting in 1,275 jobs. Finally, the impact of immigrant spending on total production in Nebraska's Western region was \$238 million, resulting in 1,896 jobs.
- Nebraska's immigrant population makes a substantial contribution to the labor force in some of the state's key economic sectors: construction, hotel and food services, and meat, poultry, and fish processing. The immigrant labor force accounted for 9.65 percent of total employment in construction in 2006, 7.3 percent of total employment in the services sector, and 80.4 percent in meat processing.
- In this study, we conducted experiments addressing what would happen if the immigrant portion of the labor force were unavailable in these key sectors. We found that total state production would fall by \$13.5 billion if these immigrants were not present in these sectors, about 8.75 percent of total state production. If just the Central and South American immigrant population were removed from these sectors, the resulting loss to the state would be \$11.4 billion, or 7.9 percent of total state production.
- Total production losses in the state's main, densely populated areas would be \$5.4 billion. Losses would amount to \$3.9 billion and \$2.8 billion in the state's Eastern and Western regions, respectively. These would represent significant losses to these regions' employment as well. For instance, in the state's densely populated regions, total job losses could be as high as 35,140, or about 6.5 percent of total jobs in the regions.
- The state's immigrant population contributed about \$154 million in the form of property, income, sales, and gasoline tax revenue in 2006. This amounts to about \$1,554 in per capita contributions. By contrast, the state's corresponding per capita contribution from the native-born population is about \$1,944.
- In terms of government costs, the immigrant population in Nebraska accounted for \$144.78 million from food stamps, public assistance, health, and educational expenditures in 2006. This amounts to about \$1,455 per capita. By contrast, the corresponding per capita costs from the native-born population are about \$1,941.
- While the contribution to cost ratio is 1.0 for the native population, the corresponding ratio for the immigrant group is 1.07, indicating that this group "pays in" about 7 percent more of what it uses in terms of governmental support.

Executive Summary Table.

Economic Impacts:	Production Generated (\$ millions)	Employment Generated (# jobs)
<i>Impact of Immigrant Spending</i>		
State of Nebraska	\$1,643.32	12,447.5
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$1,138.34	8,330.7
Eastern Region of Nebraska	\$203.94	1,275.4
Western Region of Nebraska	\$238.32	1,895.7
<i>Impact of Removing Immigrant Employment</i>		
State of Nebraska	-\$13,461.60	-78,070.7
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$5,432.65	-35,139.3
Eastern Region of Nebraska	-\$3,852.79	-18,372.3
Western Region of Nebraska	-\$2,802.28	-15,648.2
Fiscal Contributions and Costs to Nebraska:	Foreign Born	Native Born
Contributions per capita (\$)	\$1,554.27	\$1,943.53
Costs per capita (\$)	\$1,455.11	\$1,941.05
Ratio of contributions to costs	1.07	1.00

Source: See text.

Technical Note about the foreign born included in this report. For purposes of this report, Mexico, Cuba, Jamaica and the Dominican Republic, among others, are included under the “Central and South American” category. The total foreign born category includes both those from Central and South America as well as the rest of the world. Table A1, in Appendix A, identifies the country of origin for the delineations used in this study.



Measuring the Economic Impact of Migration An Introduction

Immigration as a national and local issue has been present in our nation's history from its very beginning. While its prominence in national debates has ebbed and flowed in the past, it has without doubt again assumed center stage in policy circles at every level of government as the number of new immigrants, many undocumented and many from Latin American nations, has risen markedly in recent years. This is certainly true in Nebraska. According to US Census figures, in 2000, the total immigrant population was estimated to be 74,638. By 2006, this figure had risen to 99,500, a 33.3 percent increase. By comparison, between 2000 and 2006, the total native-born population in the state grew less than 2.0 percent. Thus, the share of foreign-born residents in the state has increased markedly in recent years.

This trend has occurred in other states as well. Not surprisingly, the various social and economic effects

of immigration have once again piqued the interest of many economists, sociologists, political scientists, and policymakers. The recent academic literature in economics has focused on the impact of immigration on the labor market, with little consensus. Borjas (2003), for instance, found evidence that increased immigration places significant downward pressure on wages in a variety of sectors. Indeed, his analysis suggests that a 10 percent increase in immigration can reduce wages by as much as 4 percent in lower-skilled occupations. However, Card's (2005) analysis suggests that Borjas's conclusion is too pessimistic, finding little evidence of any substantive link between wages and immigration. Indeed, this lack of consensus in the literature highlights a significant complexity in labor market dynamics that makes it difficult at best to conclude that immigrants necessarily pressure wages downward in the long run. This is a debate that will not be settled any time soon.¹

¹ For a recent summary and critical assessment of the evidence on the impact of immigrants on native wages and job displacement, see Murray, Batalova, and Fix (2006) and Pedace (2006). The latter study is of particular note. The author argues that most studies fail to account for the segmented nature of the US labor market. Labor market segmentation mitigates competition among those groups of workers, including African Americans, who tend to occupy different employment niches (e.g., public sector versus manufacturing employment). Additionally, native workers often transition more easily to primary sector jobs, exiting jobs in the lesser-skilled, lower-wage secondary sector where immigrants are more likely to concentrate. Moreover, Pedace's statistical analysis suggests that Hispanic women may benefit least from immigration. Gouveia (2006) examines the issue of occupational niches for immigrants and, to some extent, African Americans in Nebraska. Her analysis, based in part on census data, suggests that competition between these two groups is indeed minimal, but much remains to be known about the root causes of economic and educational disadvantages of all low-income workers in Nebraska; most of such causes preceded the arrival of large numbers of immigrants.

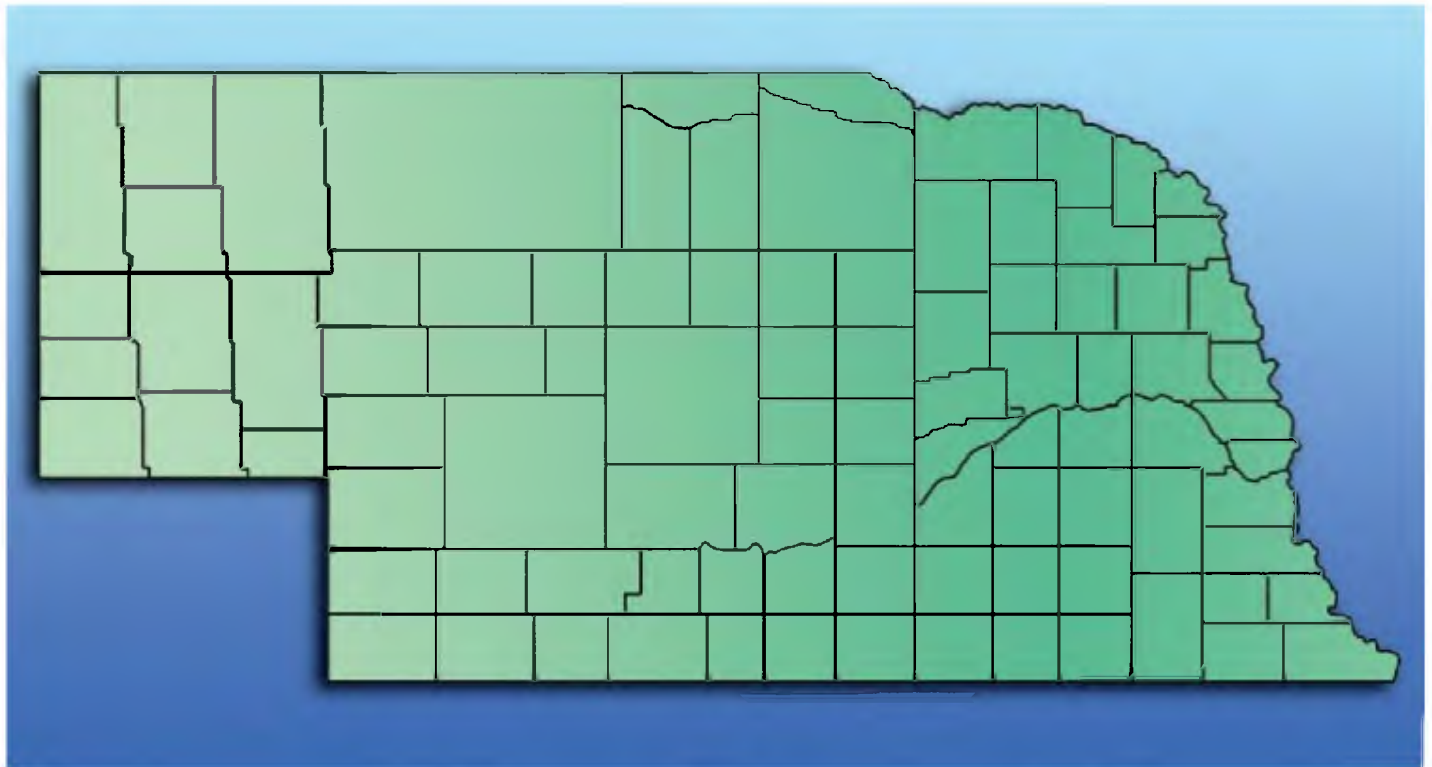
Perhaps as a consequence of the general inability to conclusively demonstrate a wage-immigration link by sector or demographic group, some studies have taken a broader view of immigration's impact on an economy. For instance, James, Romine, and Zwanzig (1998) find that immigrant inflow has buoyed housing markets and local business in a number of major US cities that had been experiencing economic declines in the 1970s and 1980s. Finally, a major issue is the degree to which increased immigration places greater pressure on local communities' ability to supply public services such as education and health services relative to these groups' ability to contribute in the form of property, income, and sales taxes. Here evidence is scant. Recently, however, Garvey, Espenshade, and Scully (2002) found that in New Jersey the state's immigrant population tended to "pay in" more than they received from state and local services relative to their native-born counterparts. Kasarda and Johnson, Jr. (2006) found some evidence indicating a reverse situation for North Carolina.

Many studies have looked more broadly at the economic impact of immigration, rather than taking an isolated view of unskilled labor markets or public benefits and costs. In a study of the Arizona economy, Gans

(2007) found that immigrants in that state accounted for \$44 billion worth of total production in 2004. Also, the Fiscal Policy Institute (2007) in New York found that immigrants accounted for \$229 billion worth of total production in 2004. Finally, while focusing mostly on North Carolina's Hispanic population, a large percentage of which are foreign born, Kasarda and Johnson, Jr. (2006) indicated that this population generated a substantial amount of employment and economic activity within that state.

This broader view of immigration's impact on an overall economy is the focus of this analysis. To that end, this report attempts to quantitatively assess the economic impact of international migrant population movements into the state of Nebraska. To date, no such comprehensive study has been undertaken for this state, in spite of the substantial increase in immigrant population flows in recent history, especially over the last decade. While the report considers the economic impact of all immigrants to the state, particular attention will be directed toward immigrants coming from Central and South American countries since the majority of immigrants to Nebraska are from these regions.²

² While another important issue is the economic impact of state-to-state net migration within the United States, this report does not consider such dynamics. Our focus is on international migration. Moreover, we do not address issues of when or why such migration took place. We are interested in measuring the effects of immigration rather than their cause. Indeed, our specific focus is on providing a "snapshot" of the impact that first-generation immigrants who have settled in the state are having on the Nebraska economy. For studies analyzing the causes of migration to the United States, there are a number of useful references, many drawn from the sociological literature. Interested readers should see, for instance, Portes and Rumbaut (2006), Waldinger and Lee (2001), and Massey, Durand, and Malone (2002). For a regional analysis, see Gouveia and Saenz (2006). For an examination of the global forces behind world and US migration, see Castles and Miller (2003). For a more detailed explanation about how countries of origin were aggregated see Appendix A.



Major Elements and Regional Scope of Impact Study

To conduct an economic impact study, most researchers employ an Input/Output (IO) model. An IO model, originally developed by Wesley Lontief (1936) and therefore often called Lontief models, describes an economy as a series of interlinked industries or sectors. A stimulus to one sector, such as an increased wage-earning labor force, then impacts all other sectors, to varying degrees, through a “multiplier effect.” This is illustrated in Figure 1 below.

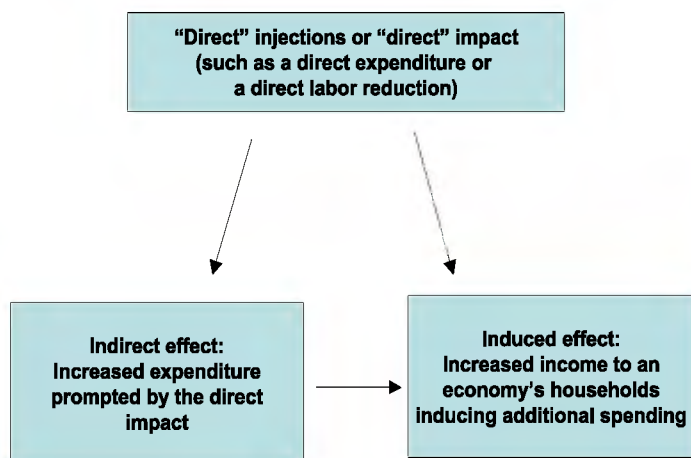
The multiplier effect measures the “indirect” and “induced” impact or effect of a direct injection. As a matter of technical exposition, “indirect” effects are those re-spending effects that filter through other industries in an economy as a result of the direct injection. For instance, suppose a direct impact on hotel expenditures boosts demand for cleaning services at those hotels (a first indirect effect). This stimulates demand for cleaning capital and products (a second indirect effect). This second indirect effect stimulates demand in other sectors, and so on. The sum of all these effects on other industries is the “indirect” effect. The “induced” effect is the effect on final demand in an economy. Final demand can be characterized in the following way. All of these sectors employ people locally. Increased demand for production (output)

from these sectors induces additional labor inputs, paid for via wages and salaries. The resulting increase in employee incomes induces additional spending locally. This additional spending is the “induced” effect. The continual “re-spending” of the original direct injection accumulates all through the local economy.

The total impact, then, is the sum of the direct, indirect, and induced effects. From these figures, we obtain economic multipliers, which measure the impact of one dollar’s worth of direct injections. For instance, if an additional \$100 of direct expenditure is spent on groceries, this would stimulate spending by the grocery sector to source grocery items from suppliers. This spending might be \$40. In turn, there may be a need for additional labor in the grocery sector, generating additional income and thus additional spending of perhaps \$15. Taken together, the aggregate impact of the initial \$100 injection was \$155 to the economy.

As is generally done, these effects are normalized to one dollar, meaning that, in our example, one dollar of direct spending results in an addition of 55 cents to the economy; the overall impact is \$1.55. This figure is commonly referred to as the final demand multiplier. The overall dollar impact on an economy is often called

Figure 1.
The Multiplier Effect

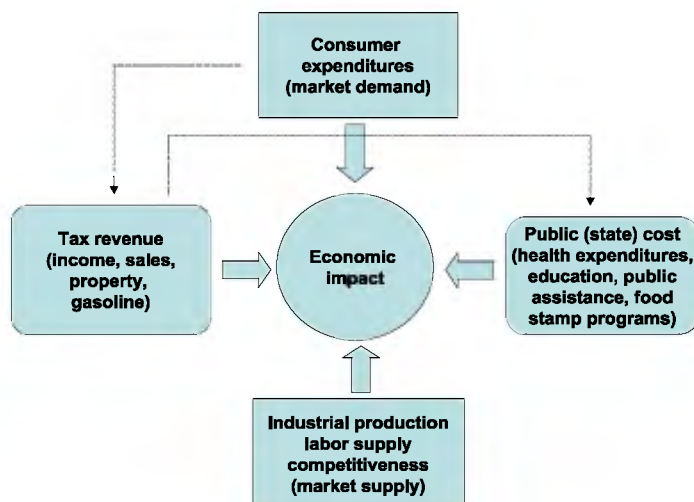


the "multiplier effect."

Following Kasarda and Johnson, Jr. (2006), most impact studies of this nature generally have four basic elements. These elements, depicted in Figure 2, are as follows:

- **Consumer expenditures impact:** This effect focuses attention on the demand side of an economy. A given group, such as first-generation immigrants, will be income earners and will spend income on a variety of locally provided goods and services in certain sectors of the economy. These expenditures are our "direct" injection expenditures. These expenditures will in turn stimulate further "indirect" spending increases and increased labor earnings, generating the "induced effect." Taken together, these direct, indirect, and induced expenditures provide a measure of total expenditure impact on an economy.
- **Production impact:** The production impact measures the effect of an increase/decrease in labor on an economy. This, too, will have a multiplier effect associated with it. For instance, a reduction in the meat processing industry of 100 workers will result in lower production in the meat processing sector. Moreover, as a result of reduced production and incomes, there will be lower demand for other goods and services in an economy, thus creating an adverse indirect effect on other sectors of the economy. Moreover, lower household incomes create an adverse induced effect. The total impact is, again, measured by a total multiplier effect.

Figure 2.
The Major Elements of an Economic Impact



- **Fiscal contributions:** Increases in employment, immigrant or otherwise, generate income tax revenue for the state. Moreover, to the extent that these populations own homes, property tax revenue is generated. Finally, sales tax revenue is generated on spending, and excise tax revenue is generated on the sale of gasoline. These fiscal contributions to state and local economies support education, health services, road construction and repair, and so on. These effects must also be considered as part of the overall impact on an economy.
- **Public sector costs:** Increased population, immigrant or otherwise, will place increased pressure on public goods and services. Hence, part of the impact on the economy needs to address this increased demand. As discussed in detail below, in this study we consider expenditures on food stamps, public assistance support supplied by the state of Nebraska, cost of supplying educational services, and state support for health care expenditures. There may be other public sectors to consider; however, in Nebraska these categories tend to be the major sources of public expenditure.

Data Sources and Model Platform Utilized for Immigration Analysis

Throughout this report, data sources are referenced. However, the primary data source is the American Community Survey Public Use Microdata Sample (PUMS) data system available from the US Census Bureau. For additional details regarding these data, see Appendix A. These data offer researchers the most recent and comprehensive secondary statistical data

source of demographic and economic information at the state and county geographic levels. From this data source we obtain information on population and income by demographic group as well as employment by industrial sector and demographic group. To these data we apply a number of other sources of information to obtain estimates of necessary economic variables.

In terms of model platform, the key to a complete impact study is to employ an IO model measuring both direct injections and the resulting indirect and induced effects that result from the multiplier effect. Creating multipliers requires an IO model that can be costly and data-intensive to create. Fortunately, there are many sources of such models and multipliers. One of the most common models used is IMPLAN, developed by the Minnesota IMPLAN Group, Inc. (MIG, Inc.).³ The IMPLAN model provides substantial industry detail (a desirable characteristic as multipliers will vary from industry to industry), provides substantial detail on direct injections and indirect effects, and is quite flexible in that it allows users to input a variety of market characteristics that may be unique to a particular area of the country. IMPLAN is used throughout this analysis.⁴

Geographic Scope of Impact Study

This study focuses primarily on state-level impacts. However, in Nebraska, characteristic of only a few US states, there is a significant dichotomy between its more densely populated and less densely populated economies. The counties that comprise the Omaha and

Lincoln Metropolitan Statistical Areas account for nearly 50 percent of the state's population. Moreover, there are significant differences between Nebraska's Western regions, roughly west of the 100th meridian, just to the west of Grand Island and Hastings, Nebraska, and its Eastern regions.⁵

Several common measures are used to describe the industrial composition of a regional economy for comparative purposes. One measure is a location quotient (LQ). These measures compare the employment share of a given industry in a particular region with the employment share of the same industry for a broader region (in this case, the state of Nebraska as a whole). An LQ exceeding the value 1 for a given industry indicates that a given region has a larger share of employment in that industry than the state as a whole, suggesting the industry is of particular importance to the economic base, or foundation, of the region.

Another measure is a regional Herfindahl Hirshman Index (HHI). This is a measure of industrial diversity within a given regional economy. It is calculated by summing up the squared industrial shares for all industries within a region.⁶ The more diverse an economy's industrial structure is, the smaller the HHI value.⁷ The more concentrated an economy is in a given set of industries, the higher the associated HHI value.

For this study, we constructed three regions: a "Tri-County" region comprised of Douglas (the densely

³ For details regarding IMPLAN, visit <http://www.implan.com>.

⁴ This program essentially includes, for a given user-defined geographic economy, a mathematical matrix of data that measure the industrial structure of the defined economy. This matrix (this so-called IO matrix) accounts for the fact that each sector in an economy depends on inputs supplied by other sectors in an economy. Hence, any external factor that directly impacts one sector will have the "ripple effects" that filter through the rest of the economy, as described above. This, then, generates the multipliers discussed above. MIG updates the data used in the model periodically, the latest measures of expenditure and employment data representing information for 2006. The primary data sources IMPLAN uses come from survey data and estimates generated by the US Bureau of Economic Analysis. In Appendix D, we provide a brief overview of IO models. However, for more detail, readers are referred to Raa (2005), Yan (1969), and Hewings (1985). Each provides an excellent overview. Note further that the IMPLAN model produces several different types of effects. The main effect is the dollar value impact on total economy-wide production or output. Once these figures are obtained from direct, indirect, induced, and total effects, IMPLAN will calculate other economic measures. One such measure of interest to this study is the employment effect, i.e., the number of jobs added to (or subtracted from) an economy as a result of some direct impact.

⁵ One major difference is climate. There is substantial difference in rainfall amounts east and west of the 100th meridian.

⁶ Specifically, let the employment share of industry i be defined as s_i for an economy's n different industrial sectors. The HHI is then calculated as

follows: $HHI = \left(\sum_{i=1}^n s_i^2 \right) * 10,000$. The 10,000 value in this calculation is a scaling factor and has no meaningful impact on the interpretation of the HHI values.

⁷ Recent research tends to conclude that diversity is generally a desirable characteristic of regional economies because it acts as an "insulating" characteristic beneficial to weathering economic downturns. Since different sectors are impacted to varying degrees by economic downturns, the more diverse an economy, the less impacted such an economy will be by national or statewide recession.

TABLE 1. Regional Breakdown

	Tri-County	Eastern Nebraska			Western Nebraska	
County:	Douglas	Antelope	Merrick	Adams	Frontier	Kimball
	Lancaster	Boone	Nance	Arthur	Furnas	Lincoln
	Sarpy	Burt	Nemaha	Banner	Garden	Logan
		Butler	Nuckolls	Blaine	Garfield	Loup
		Cass	Otoe	Box Butte	Gosper	McPherson
		Cedar	Pawnee	Boyd	Grant	Morrill
		Clay	Pierce	Brown	Greeley	Perkins
		Colfax	Platte	Buffalo	Hall	Phelps
		Cuming	Polk	Chase	Harlan	Red Willow
		Dakota	Richardson	Cherry	Hayes	Rock
		Dixon	Saline	Cheyenne	Hitchcock	Scotts Bluff
		Dodge	Saunders	Custer	Holt	Sheridan
		Fillmore	Seward	Dawes	Hooker	Sherman
		Gage	Stanton	Dawson	Howard	Sioux
		Hamilton	Thayer	Deuel	Kearney	Thomas
		Jefferson	Thurston	Dundy	Keith	Valley
		Johnson	Washington	Franklin	Keya Paha	Wheeler
		Knox	Wayne			York
		Madison	Webster			

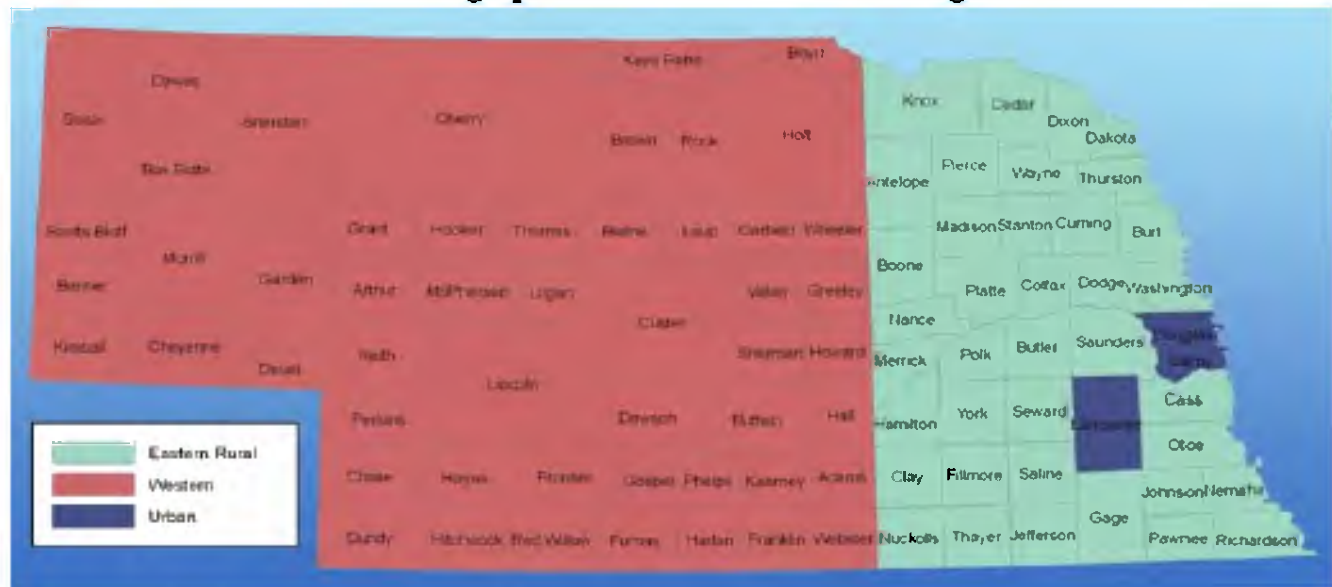
Source: Author's delineation

populated portions), Sarpy, and Lancaster counties (essentially Omaha and Lincoln), an “Eastern” Nebraska region comprising counties in the eastern part of the state (excluding the Tri-County area), and a “Western” Nebraska region.

Table 1 provides a specific county-by-county breakdown of these regional delineations.⁸ Figure 3 provides a geographic depiction of these regional breakdowns as well.

The LQ and HHI figures were calculated based on employment data available from the US Bureau of Economic Analysis (BEA).⁹ Table 2 shows the LQs and HHIs for the three regions of interest in this report. In terms of the HHIs, the data suggest that, characteristic of many, more densely populated economies, the Tri-County area of Nebraska has a more diverse economy than does the state’s Western and Eastern regions.

Eastern Nebraska has a very high concentration of

Figure 3.**Geographic Breakdown of Nebraska Regions**

⁸ For largely pragmatic reasons, we did not break the data down into further subregions. The PUMS data are based on a sampling of residents in locations throughout the state. To further refine these geographic areas would have resulted in severe small sample biases in the data, making any inferences regarding population characteristics much more unreliable.

⁹ BEA's Regional Economic Information Services (REIS) provide such employment data currently through 2005. These figures were thus based on the 2005 estimates. These data are available at <http://www.bea.gov/regional/reis/>. Note that some of these industry data are subject to disclosure issues, indicating several missing variables. The authors generated estimates for these missing variables utilizing state-level shares of employment data as well as other information sources. Details regarding these estimates are available upon request from the authors.

Table 2. Locations Quotients and Herfindahl Hirshman Indexes

	LQs		
	Tri-County	Eastern Nebraska	Western Nebraska
Farm employment	0.09	1.46	2.29
Mining	0.44	1.94	0.77
Utilities	0.83	1.68	0.31
Construction	1.19	0.64	1.15
Manufacturing	0.88	1.04	1.20
Wholesale trade	1.02	0.73	1.38
Retail trade	1.11	0.59	1.38
Transportation and warehousing	0.64	1.80	0.55
Information	1.45	0.50	0.79
Finance and insurance	1.41	0.48	0.89
Real estate and rental and leasing	1.29	0.60	0.98
Professional and technical services	1.50	0.41	0.81
Management of companies and enterprises	1.71	0.32	0.49
Administrative and waste services	1.41	0.54	0.81
Educational services	1.48	0.64	0.49
Health care and social assistance	1.20	0.74	0.97
Arts, entertainment, and recreation	0.71	1.78	0.43
Accommodation and food services	0.61	1.79	0.64
Other services, except public administration	0.99	0.86	1.24
HHI	727.29	1121.89	845.38

Source: Author's calculations based on data from the Regional Economic Accounts, Bureau of Economic Analysis, US Department of Commerce. Retrieved January 25, 2008 (<http://www.bea.gov/regional/reis/>).

transportation and warehousing service jobs (accounting for about 18 percent of employment in this region), as well as food service establishments (accounting for about 22 percent of employment). In Western Nebraska, farm employment accounts for about 11 percent of employment, and retail trade and health services account for 16 and 10 percent, respectively.

The LQ data demonstrate that, while the Tri-County region of the state is more diverse, many service-oriented jobs are concentrated there. In particular, information services (with an LQ of 1.45), financial services (with

an LQ of 1.41), management services (1.71), and educational services (1.48) appear to be concentrated in this region. These sectors tend to generate higher-paying jobs than many other sectors more prominent in less densely populated regions of the state. For instance, in Eastern Nebraska, farm employment, jobs in mining, utilities, transportation and warehousing, and food services tend to have very high LQs. In Western Nebraska, the LQs are relatively large in agriculture and wholesale and retail trade. Again, these sectors do not necessarily carry as high a level of compensation as those sectors concentrated in the Tri-County region.



Expenditure Impacts of First-Generation Foreign-Born Immigrants

As stated above, the primary data source used is the US Census's PUMS data system. Table 3 provides a summary picture of the demographic and earnings figures for the state as a whole as well as the three subregions described earlier.

The data reflect a few essential elements. While the total immigrant population represents about 5.6 percent of the total population (and about 6.7 percent of the total population of income earners aged 16 and over), as we show below, the impact on overall state expenditures tends to be less than these population percentages because these groups tend to earn less (\$26,195 per year for the immigrant population versus \$31,297 for the total population).¹⁰

State-Level Impacts

To obtain a measure of consumer expenditures, we used the income data from the 2006 PUMS data system. From these figures, we deducted federal and state income taxes as well as payroll taxes. This provided a

reasonable measure of after-tax personal income.¹¹ For the immigrant populations, we deducted a percentage of income remitted (i.e., sent or transferred) to immigrants' country of origin. In particular, for Central and South American remittances (by far the group with the greatest propensity to send earned income to their home country), we employed data from the Inter-American Development Bank, which found that an estimated \$154 million was remitted to country of origin in 2006, representing about 23 percent of after-tax income for the immigrant population from Central and South American countries.¹² The total estimated after-tax and remittances income for the state of Nebraska in 2006 was \$1.188 billion for total foreign-born immigrants and \$516.1 million for immigrants from Central and South American countries. These figures were put into IMPLAN to generate the overall impact of such spending on the state; they are presented in Table 4.¹³

As shown in Table 4, the direct expenditure by the state's income-earning, foreign-born population aged 16 and

¹⁰Also, the Central and South American immigrant populations tend to send a substantial portion of their take-home pay to family still residing in their respective countries of origin. We will discuss this issue below.

¹¹For details on this procedure, see Appendix B.

¹²For details on how these remittances figures were obtained and implemented, again see Appendix B.

¹³With aid from MIG, a set of figures was developed that estimated, for a given income range, the share of one dollar's (continued on next page)

Table 3. Summary of Population and Income Characteristics for 2006

	Total	Native Born	Foreign Born	Central & South American Born
Nebraska				
Population	1,768,331	1,668,831	99,500	57,172
Population 16 and over - wage and salaried plus self-employed	1,050,028	980,184	69,844	40,382
Mean Income (\$)	\$31,297.35	\$31,660.92	\$26,195.10	\$21,825.02
Total Income (\$ millions)	\$32,863.10	\$31,033.52	\$1,829.57	\$881.34
Tri-County (Douglas, Sarpy, and Lancaster Counties)				
Population 16 and over - wage and salaried plus self-employed	536,522	491,180	45,342	
Mean Income (\$)	\$34,938.21	\$35,571.85	\$28,074.14	
Total Income (\$ millions)	\$18,745.12	\$17,472.18	\$1,272.94	
Eastern Nebraska				
Population 16 and over - wage and salaried plus self-employed	256,979	244,296	12,683	
Mean Income (\$)	\$27,644.88	\$27,993.98	\$20,920.59	
Total Income (\$ millions)	\$7,104.15	\$6,838.82	\$265.34	
Western Nebraska				
Population 16 and over - wage and salaried plus self-employed	256,527	244,708	11,819	
Mean Income (\$)	\$27,341.46	\$27,471.62	\$24,646.54	
Total Income (\$ millions)	\$7,013.82	\$6,722.52	\$291.30	

Source: U.S. Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

Table 4. Economic Impact of Immigrant Spending on the State of Nebraska

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact (\$ millions)				
Total Foreign Born	\$1,188.38	\$228.08	\$226.87	\$1,643.32
Central & South American Origin	\$516.10	\$100.97	\$99.50	\$716.57
Employment Impact (# jobs)				
Total Foreign Born	8,161.1	1,953.9	2,332.5	12,447.5
Central & South American Origin	3,527.4	854.6	1,023.0	5,405.0

Source: Author's estimates using IMPLAN 2.0

over of \$1.188 billion in 2006 resulted in \$228.1 million in indirect and \$226.9 million in induced expenditures, a total impact of \$1.643 billion to Nebraska's economy. By dividing the total impact by the direct impact, we obtain our impact multipliers. The production multiplier in this case is 1.38, indicating that for every dollar spent by the state's immigrant population, 38 additional cents are created through indirect and induced effects. This \$1.643 billion figure represents about 1.1 percent of total production in the state of Nebraska.¹⁴

The employment effect is larger. The direct spending by the state's immigrant population aged 16 and over required 8,161 jobs. This direct impact then generated an additional 1,954 jobs and 2,333 jobs to cover the indirect and induced effects, respectively. The overall effect of 12,448 jobs thus indicates an employment multiplier of 1.52, indicating that for every 10 jobs created as a result of direct expenditures, a little over five additional jobs are generated through the indirect and induced effects. The total 12,448 jobs created represent about 1.2 percent of the total 1.05 million

worth of expenditure on each of a set of 395 industrial sectors. For instance, individuals earning between \$25,000 and \$50,000 per year spent 2.2 percent of their disposable income in the motor vehicle and parts sector. These expenditure shares were derived from Consumer Expenditure Survey publications provided by the US Bureau of Labor Statistics (see <http://www.bls.gov/cex/home.htm>). We then modified some of these shares to better reflect the spending habits exhibited by the primary immigrant population in the state, those from Central and South America. For instance, a recent UCLA study found that Latin American foreign-born immigrants are 50 percent less likely to use emergency rooms than are US-born Latin Americans (see http://www.pnhp.org/news/2007/november/study_finds_immigran.php). Moreover, evidence from the US Department of Health and Human Services' Medical Expenditure Panel Survey indicates that in 2000 Hispanic Americans spent only about 61 percent per capita on health expenditures relative to other citizens (see http://meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml). Since the data suggest that such immigrants spend less on health services and more on food consumed at home and home repair and maintenance, we increased these shares of expenditures within IMPLAN.

¹⁴According to data supplied by MIG, total state output was \$153.8 billion in 2006.

income earners in Nebraska as of 2006 (see Table 3).

For the immigrant population from the Central and South American regions, the initial \$516.1 million in direct spending resulted in \$716.6 million of total production, resulting in a production multiplier of 1.39. The overall impact from an initial set of 3,527 jobs needed to cover the direct spending from this group ultimately generated a total of 5,405 jobs, an employment multiplier effect of 1.53. This total employment impact represents about 0.51 percent of total income earners in the state.

The figures in Table 5 show the top 15 industrial sectors (as measured by total production generated) most impacted by Nebraska's immigrant spending.

Most of the total production generated is taken up by the retail trade and owner-occupied dwellings sector, with wholesale trade, health expenditures, food services, and motor vehicles and parts sectors also being impacted. It is important to note that these sectors do not represent spending by the immigrant populations only. These production effects are the result of the total effects on the state's economy (including indirect and induced effects). With that in mind, it is interesting to note that a few of these sectors, such as health services, appear to benefit from increased immigrant spending patterns even though there is evidence that many immigrant populations tend to have lower home ownership rates and spend proportionately less on health services than their native-born counterparts.

Table 5. Top 15 Industries Impacted by Immigrant Spending

Industry	Total Production (\$ millions)
Total Foreign Born	
1 Domestic retail trade	\$343.96
2 Owner-occupied dwellings	\$118.82
3 Foreign retail trade	\$80.77
4 Wholesale trade	\$71.40
5 Real estate	\$59.67
6 Food services and drinking places	\$59.53
7 Offices of physicians, dentists, and other health	\$55.39
8 Hospitals	\$45.53
9 Monetary authorities and depository institutions	\$40.71
10 Pharmaceutical and medicine manufacturing	\$35.09
11 Insurance carriers	\$31.07
12 Motor vehicle and parts dealers	\$30.85
13 State and local government electric utilities	\$27.22
14 Nursing and residential care facilities	\$24.00
15 General merchandise stores	\$22.66
Central/South American Born	
1 Domestic retail trade	\$146.95
2 Owner-occupied dwellings	\$52.98
3 Foreign retail trade	\$32.31
4 Wholesale trade	\$31.32
5 Real estate	\$26.24
6 Offices of physicians, dentists, and other health	\$24.13
7 Food services and drinking places	\$23.66
8 Pharmaceutical and medicine manufacturing	\$20.07
9 Hospitals	\$19.84
10 Monetary authorities and depository institutions	\$15.42
11 Motor vehicle and parts dealers	\$13.20
12 State and local government electric utilities	\$13.01
13 Insurance carriers	\$12.66
14 Nursing and residential care facilities	\$12.01
15 Other ambulatory health care services	\$9.85

Source: Author's estimates using IMPLAN 2.0

Table 6. Economic Impact of Immigrant Spending by Region

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact (\$ millions)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$823.44	\$157.29	\$157.60	\$1,138.34
Eastern	\$174.17	\$16.19	\$13.58	\$203.94
Western	\$189.71	\$24.31	\$24.30	\$238.32
Employment Impact (# jobs)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	5,461.3	1,336.7	1,532.7	8,330.7
Eastern	963.2	160.4	154.9	1,275.4
Western	1,336.9	249.6	299.2	1,895.7

Source: Author's estimates using IMPLAN 2.0

Regional Impacts

Table 6 summarizes the production and employment impacts of total foreign-born spending by region. In the Tri-County area that includes most of Omaha and all of Lincoln, the state's foreign-born population aged 16 and above spent an estimated \$823.4 million in 2006. This translated into a total production effect of \$1.138 billion, indicating a multiplier of 1.38, largely mimicking the state multiplier impact. Moreover, this direct spending prompted a labor need of 5,461, which ultimately generated a total of 8,331 jobs, implying an employment multiplier of 1.53. This final employment figure represents about 1.6 percent of total income earners in these counties.

For Nebraska's less densely populated economies, direct spending from the state's immigrant population is relatively small, owing in large measure to fewer such individuals living in these areas as well as smaller per capita incomes. The Eastern immigrant population spent

an estimated \$174 million in 2006, generating a total impact of \$204 million, a multiplier of 1.17. Economic activity among immigrants in the Western region of the state was marginally better. The \$190 million in direct spending in 2006 by this group generated a total production effect of \$238 million, a multiplier of 1.26 (see Figure 4).

The employment impacts follow a similar pattern. The 963 jobs needed to meet increased immigrant spending demands in Eastern Nebraska ultimately generated a total employment multiplier effect of 1.32. This total employment figure of 1,275 represents about 0.50 percent of total income earners in this region.

In Western Nebraska, the employment multiplier is 1.42. Hence, initial employment needs ultimately created a total of 1,896 jobs. This represents about 0.74 percent of total income earners in this region.

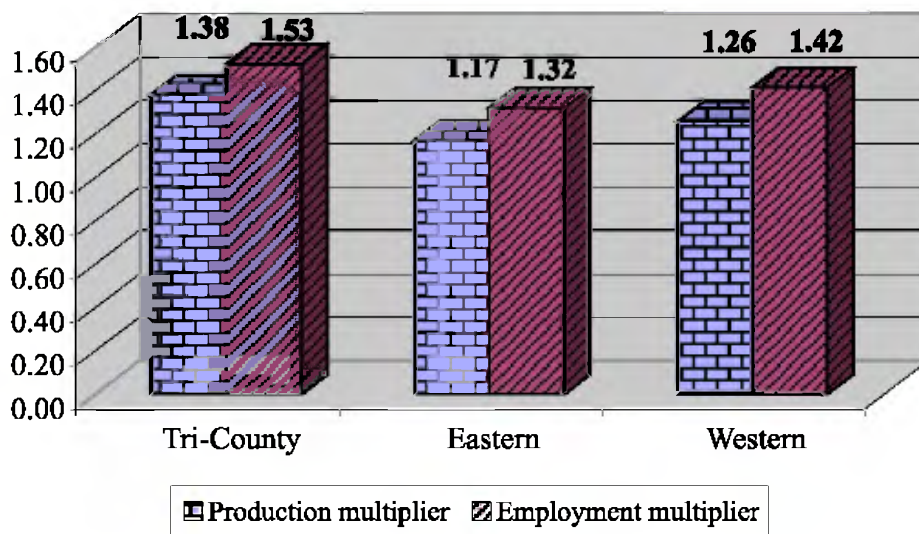
Figure 4. Expenditure Effects: Production and Employment Multipliers by Region

Table 7. Alternative Total Economic Impact of Immigrant Spending: High and Low Remittances

	High Remittance	Low Remittance
Production Impact (\$ millions)		
State:		
Total Foreign Born	\$1,567.61	\$1,732.20
Central & South American Origin	\$652.70	\$791.54
Regions:		
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$1,085.89	\$1,199.90
Eastern	\$194.55	\$214.97
Western	\$227.34	\$251.21
Employment Impact (# jobs)		
State:		
Total Foreign Born	11,874.0	13,120.7
Central & South American Origin	4,923.2	5,970.5
Regions:		
Tri-County (Douglas, Sarpy, and Lancaster Counties)	7,946.9	8,781.2
Eastern	1,216.6	1,344.4
Western	1,808.3	1,998.2

Source: Author's estimates using IMPLAN 2.0

Alternative Expenditure Estimates

While the expenditure figures provided above represent the most likely picture of immigrant expenditure impacts on Nebraska, it is worth remembering that these estimates are derived from sample data. For instance, the remittances figure of \$154 million for 2006 was based on a sampling survey. Hence, it can be beneficial to provide a range of impacts assuming alternative direct expenditure figures. To this end, alternative direct expenditure figures were constructed using alternative estimates for Central and South American remittances. Specifically, we assumed, while the best estimate for these remittances in 2006 is still the \$154 million figure, a high remittance level of \$200 million (about 30 percent of the Central and South American group's after-tax income), and a low remittance level of \$100 million (about 15 percent of after-tax income).¹⁵

Table 7 reports the total production and employment impacts (i.e., the direct, indirect, and induced impacts) from these high and low remittance scenarios on the state of Nebraska and the three regions considered in this study. Based on these estimates, the total production impact of expenditures by the foreign-born population ranges from \$1.568 billion to \$1.732 billion. In terms of employment, expenditures by immigrants in the state generated between 11,874 and 13,121

jobs. Isolating just direct expenditures from those immigrants of Central and South American origin, the total production impact ranges from \$653 million to \$792 million, with employment generation between 4,923 and 5,971.

Regionally, the Tri-County area experienced between 7,947 and 8,781 new jobs due to immigrant spending in 2006 and increased production between \$1.086 and \$1.200 billion. The Eastern region saw an increase of 1,217 to 1,344 new jobs, and between 1,808 and 1,998 new jobs were generated in the Western region.

¹⁵Admittedly, this range is somewhat arbitrary since no information was provided by the Inter-American Development Bank as to the margin of error in their 2006 survey. This same group conducted a similar survey in 2004 and indicated a margin of error of +/-5 percent in that survey. If a similar margin of error exists in the 2006 survey, then the upper and lower bounds provided above are well outside such a +/-5 percent range. The alternative results provided in this section, then, can reasonably be viewed as offering a more-than-generous upper and lower expenditure impact bandwidth of the immigrant population in the state.



Photo courtesy of David Bacon from the book Communities Without Borders

The Impact of the Immigrant Labor Force on State Production

The foreign-born population aged 16 and over in the state of Nebraska accounted for 6.65 percent of total population aged 16 and over in the state. Immigrants of Central and South American origin accounted for nearly 4 percent of the state's total population aged 16 and over. These groups' labor force contributions are considerably higher in certain key sectors of the state's economy. This labor has allowed the state to expand production, particularly in less densely populated regions where labor force availability would otherwise be quite limited. In their absence, it is quite likely that substantial reductions in Nebraska's economic production would occur.

In this section we estimate the likely impact on state and regional economies if this labor force were, in effect, unavailable. In doing this experiment, we identified three sectors that tend to rely heavily on immigrant labor (primarily from Central and South America): construction, food and hotel accommodation services, and meat, poultry, and fish processing. Table 8 summarizes these employment figures.

In the construction sector, 7,089 immigrants were employed in 2006, accounting for 9.7 percent of total construction employment (Central and South American immigrants account for nearly all of this, making up 8.6 percent of total construction employment).¹⁶ In the services sector, most of which is food and hotel accommodations services, immigrants accounted for 4,969 jobs in 2006, or 7.3 percent of total employment. Finally, in meat, poultry, and fish processing occupations, historically one of the most important manufacturing sectors in Nebraska, 11,282 immigrants were employed in 2006, accounting for 80.4 percent of total employment in this sector. Immigrants from Central and South America accounted for 9,731 of these jobs, or 69.4 percent of the total.

State-Level Impacts

With these employment figures in place, we used IMPLAN to generate estimates of what would be lost from the various state and regional economies from a hypothetical removal of these laborers.¹⁷ Table 9 summarizes the impact on the state of Nebraska. If a

¹⁶Within IMPLAN, the construction sector is comprised of 13 different subsectors, broadly comprising residential, nonresidential, and non-building (e.g., highway and utility network) construction, as well as residential, nonresidential, and non-building repairs. However, the PUMS data is available only for the aggregate category. To implement the impact within IMPLAN, we divided up the PUMS immigrant employment data, based on the total employment shares of each of these 13 subsectors, as reported within the IMPLAN model.

¹⁷This experiment ignores the potential that some of the native population may have been employed in the absence of (continued on next page)

Table 8. Employment Summary Data for 2006

	Total <i>Employed</i>	Native Born <i>Employed</i>	<i>Percent</i>	Foreign Born <i>Employed</i>	<i>Percent</i>	Central & South American <i>Employed</i>	<i>Percent</i>
Nebraska							
Construction	73,439	66,350	90%	7,089	9.65%	6,320	8.61%
Services	158,461	146,890	93%	11,571	7.30%	6,602	4.17%
Butchers and other meat, poultry, and fish processing	14,032	2,750	20%	11,282	80.40%	9,731	69.35%
Tri-County (Douglas, Sarpy, and Lancaster Counties)							
Construction	37,658	31,729	84.26%	5,929	15.74%		
Services	80,956	73,395	90.66%	7,561	9.34%		
Butchers and other meat, poultry, and fish processing	4,937	595	12.05%	4,342	87.95%		
Eastern Nebraska							
Construction	19,114	18,828	98.50%	286	1.50%		
Services	35,984	34,275	95.25%	1,709	4.75%		
Butchers and other meat, poultry, and fish processing	5,458	1,258	23.05%	4,200	76.95%		
Western Nebraska							
Construction	16,667	15,793	94.76%	874	5.24%		
Services	41,521	39,220	94.46%	2,301	5.54%		
Butchers and other meat, poultry, and fish processing	3,637	897	24.66%	2,740	75.34%		

Source: U.S. Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

total of 29,242 immigrant jobs were removed from the economy, the resulting direct impact on the dollar value of state production in 2006 would be a loss of \$6.4 billion. Furthermore, there is a reduction in indirect and induced benefits since the initial labor reduction causes less production from the three sectors—construction, services, and meat processing—resulting in less demand for inputs from other sectors of the economy (the indirect effect) and lower spending by households due to fewer income earners (the induced effect).

Thus, the value of total production lost is \$13.5 billion and total employment reduction is 78,071. To place these figures in context, according to data supplied by

MIG, in 2006 the value of total production in the state of Nebraska was \$153.8 billion. Hence, the total lost production from removing immigrant workers from the economy alone represents about 8.75 percent of total state production. The total reduction in employment of 78,071 accounts for 7.4 percent of total income earners in Nebraska (see Table 3).

Note the substantial multiplier effect here as well (2.11).¹⁸ For every one dollar of production directly lost, an additional \$1.11 is lost through indirect and induced spending reductions. Moreover, the employment multiplier is relatively large as well (2.61). For every direct job lost, an additional 1.6 jobs

Table 9. Economic Impact of Removing Immigrant Employment in Construction, Food and Hotel Services, and Meat, Poultry, and Fish Processing on the State of Nebraska

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact, 2006 (\$ millions)				
Total Foreign Born	-\$6,366.18	-\$5,499.67	-\$1,595.75	-\$13,461.60
Central & South American Origin	-\$5,363.56	-\$4,684.53	-\$1,337.58	-\$11,385.67
Employment Impact (# jobs)				
Total Foreign Born	-29,942.0	-31,720.2	-16,406.4	-78,070.7
Central & South American Origin	-22,653.0	-26,955.2	-13,752.0	-63,360.2

Source: Author's estimates using IMPLAN 2.0

immigrant labor. The issue of labor substitution is a complex issue and is addressed later in this report. Since the estimates provided by this experiment do not consider substitution of native for immigrant labor, they can reasonably be considered a type of “upper bound” effect on the total impact on production and employment.

¹⁸These multipliers can be easily calculated by dividing the total impact measures by the direct impact data. For instance, the output multiplier for the total foreign-born category is simply $\$13,461.60/\$6,366.18 = 2.11455$.

Table 10. Industries Impacted by Removing Immigrant Employment

	Industry	Total Production (\$ millions)
Total Foreign Born		
1	Meat processed from carcasses	-5,295
2	Animal (except poultry) slaughtering	-1,239
3	Cattle ranching and farming	-1,038
4	Wholesale trade	-594
5	Food services and drinking places	-563
6	Truck transportation	-290
7	New residential 1-unit structures	-257
8	Animal production (except cattle and poultry)	-234
9	Management of companies and enterprises	-219
10	Commercial and institutional buildings	-215
11	Owner-occupied dwellings	-209
12	Real estate	-154
13	Monetary authorities and depository credit intermediaries	-119
14	Maintenance and repair of nonresidential buildings	-108
15	Hotels and motels- including casino hotels	-95
Central/South American Born		
1	Meat processed from carcasses	-4,564
2	Animal (except poultry) slaughtering	-1,066
3	Cattle ranching and farming	-891
4	Wholesale trade	-504
5	Food services and drinking places	-351
6	Truck transportation	-248
7	New residential 1-unit structures- all	-229
8	Animal production (except cattle and poultry)	-201
9	Commercial and institutional buildings	-192
10	Management of companies and enterprises	-187
11	Owner-occupied dwellings	-175
12	Real estate	-127
13	Monetary authorities and depository credit intermediaries	-101
14	Maintenance and repair of nonresidential buildings	-94
15	Telecommunications	-79

Source: Author's estimates using IMPLAN 2.0

are also lost through indirect and induced impacts. These three sectors are thus critical sectors to the Nebraska economy.

Table 10 illustrates the top 15 industries hit hardest by the reduction in labor force (as measured by the total economic impact). Given the relative size of the impact associated with hypothesized reductions in the meat, poultry, and fish processing sectors, it seems reasonable that the major industries impacted would be those involved in these businesses, such as ranching and farming, wholesale trade, food services, and transportation. Also, associated reductions in many construction industries are expected as

well, particularly in new single-family residential construction.

Regional Impacts

Table 11 summarizes the regional impacts of immigrant employment in construction, food and hotel accommodations, and meat, poultry, and fish processing. Total immigrant employment in these sectors was 17,832 in the Tri-County area of Nebraska, 6,195 in Eastern Nebraska, and 5,914 in Western Nebraska as of 2006. According to the data presented in Table 10, removal of these employees would result in a direct loss of \$3.0 billion worth of production in the Tri-County area, \$1.94 billion in Eastern Nebraska,

Table 11. Economic Impact of Removing Immigrant Employment by Region

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact, 2006 (\$ millions)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$3,018.70	-\$1,683.45	-\$730.50	-\$5,432.65
Eastern	-\$1,937.03	-\$1,681.10	-\$234.66	-\$3,852.79
Western	-\$1,386.82	-\$1,172.42	-\$243.03	-\$2,802.28
Employment Impact (# jobs)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-17,832.0	-10,202.1	-7,104.2	-35,139.3
Eastern	-6,195.0	-9,491.5	-2,675.1	-18,372.3
Western	-5,914.0	-6,752.0	-2,991.9	-15,648.2

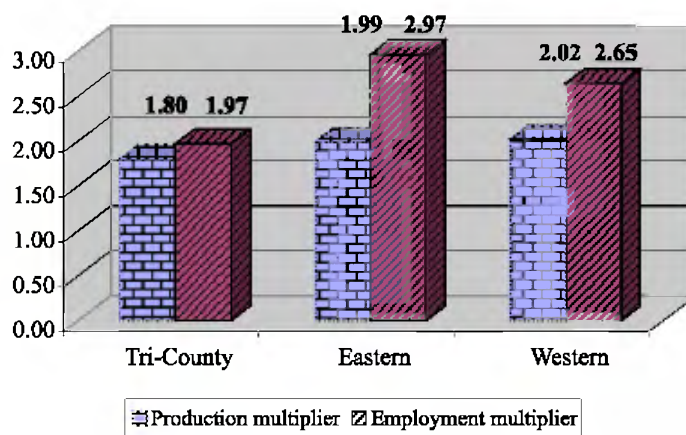
Source: Author's estimates using IMPLAN 2.0

and \$1.39 billion in Western Nebraska. Once these direct reductions in expenditures filter through the rest of these economies through the associated indirect and induced effects, the total loss to this economy is estimated to be \$5.43 billion. Aggregate losses to the Eastern and Western Nebraska economies would be \$3.85 billion and \$2.80 billion, respectively, in 2006. In terms of total employment losses, the Tri-County region would have lost 35,139 jobs, about 6.5 percent of total income earners in that economy (see Table 3); 18,372 jobs in Eastern Nebraska, representing about 7.1 percent of total income earning positions in that region; and 15,648 jobs in Western Nebraska, or 6.1 percent of total income earners.

The regional employment multipliers are particularly significant. In the Tri-County economy, the employment multiplier is 1.97 and in the Eastern and Western economies the associated multipliers are much larger, registering 2.97 and 2.65 respectively (see Figure 5).

The implication is that the industrial sectors in which immigrant workers tend to be employed are of critical importance to these regional economies, particularly in Eastern Nebraska where meat, poultry, and fish processing are vital to this region's economy. For instance, for every job lost in any one of the three identified industries in Eastern Nebraska, an additional 1.97 jobs are also lost through indirect and induced effects.

Similarly, in Western Nebraska, for every job lost in one of the three identified industries, an additional 1.65 jobs disappear through indirect and induced effects. It is also of interest to note that in the more economically diversified Tri-County region, where we would expect a

Figure 5. Production Impacts: Production and Expenditure Multipliers by Region

smaller overall multiplier effect, we observe a substantial multiplier. The Tri-County multiplier implies that a job lost in construction, meat processing, or food and hotel services results in 0.97 jobs lost through indirect and induced impacts.

Alternative Employment Impact Scenarios

The above experiments ignore the potential for labor substitution. That is, in the absence of this immigrant labor, some of the native population may have been employed. Assuming no labor substitution is an important limitation of the above analysis; however, a couple of points are germane. First, Nebraska's unemployment rates are substantially lower than many other states, as well as the nation as a whole. This is largely due to a relatively limited labor force. Hence, prospects for substituting away from an immigrant pool of labor are limited. Moreover, a more limited labor force might result in higher wages (an effect that, as the existing literature suggests, is illusive to measure at best).

Labor substitution and market dynamics are very complex issues, and estimating such substitution effects precisely would require a substantial amount of analysis far beyond the scope and intent of this study. In this section alternative impacts are presented based on assumptions regarding the degree to which jobs held by the economy's immigrant population in the construction, food and hotel accommodations, and meat, poultry, and fish processing sectors might be absorbed by the native-born labor force, as well as other key assumptions.¹⁹

Three different absorption rates are considered. The first is where 25 percent of immigrant jobs are filled by the native-born labor force; the second where 50 percent of immigrant jobs are filled by domestic workers; and the third where 75 percent of immigrant jobs are filled by the native born.²⁰ These figures, shown in Table 12, provide a range

of possible impacts from the removal of immigrant labor from the state and regional economies.

One can see that there are still substantial adverse impacts on the state and regional economies from the hypothetical removal of the immigrant labor force. Assuming a 25 percent absorption rate, the state loses \$10.097 billion worth of production and 58,553 jobs. The Tri-County region still suffers the most, losing \$4.075 billion in production and over 26,000 jobs.

Under the more favorable condition, in which 75 percent of the missing immigrant labor force is replaced with domestic labor, the state loses \$3.366 billion in production and 19,518 jobs. Again, the Tri-County economy suffers the most, losing \$1.358 million in production and 8,785 jobs.

Table 12. Alternative Total Economic Impact of Removing Immigrant Employment

	Percent of Immigrant Jobs Absorbed by Native Workers		
	25 percent	50 percent	75 percent
Production Impact (\$ millions)			
State:			
Total Foreign Born	-\$10,096.66	-\$6,730.26	-\$3,365.98
Central & South American Origin	-\$8,539.21	-\$5,693.35	-\$2,846.69
Regions:			
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$4,074.49	-\$2,716.33	-\$1,358.16
Eastern	-\$2,889.59	-\$1,926.39	-\$963.20
Western	-\$2,101.71	-\$1,401.14	-\$700.57
Employment Impact (# jobs)			
State:			
Total Foreign Born	-58,553.0	-39,035.3	-19,517.7
Central & South American Origin	-47,520.2	-31,680.1	-15,840.1
Regions:			
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-26,354.4	-17,569.6	-8,784.8
Eastern	-13,779.2	-9,186.1	-4,593.1
Western	-11,738.1	-7,825.4	-3,912.7

Source: Author's estimates using IMPLAN 2.0

¹⁹Two such assumptions are made in this section, largely due to the basic structure of IO models. First, it is assumed that native-born surplus labor is sufficient to absorb these vacated jobs. Second, closely related to the first, it is assumed that the native-born labor force would take those jobs at prevailing wages. By their very construction, IO models treat prices, including wages, as fixed, essentially assuming that there are sufficient resources in an economy to meet any changes in final demand for goods and services.

²⁰Adverse economic impacts will obviously get smaller with larger absorption rates. If 100 percent of all immigrant jobs were replaced by domestic labor, then there would be no adverse impact on the economy. With such a tight labor force, such an outcome would be highly unlikely in Nebraska.



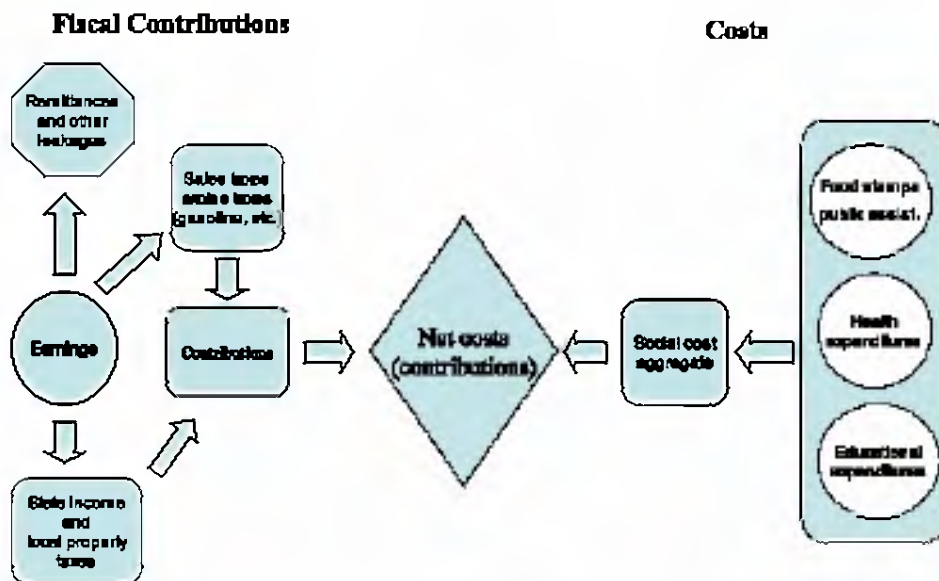
Fiscal Contributions and Social Cost Pressures from the Immigrant Population in Nebraska

The analysis above suggests that Nebraska's immigrant population does contribute substantially to the state's economy in meaningful ways. First, through their spending activity, jobs are created for both immigrants and native-born groups. Second, the sectors in which these immigrant groups are largely employed are critical to the state's economic well-being, particularly in its Eastern and Western regions.

In order to assess more completely the impact of the immigrant population on the state, however, some

detailed analysis of the fiscal contributions and social pressures this group has on Nebraska is necessary. Many concerns have been expressed suggesting that immigrant populations place more pressure on publicly supplied services, such as educational and health services, than they contribute in the form of tax revenue. In this section, we attempt, to the extent possible, to estimate these public costs and tax revenue figures for both immigrant and native populations in the state.²¹ The focus of these estimates is depicted in Figure 6.

Figure 6. Fiscal Contributions and Social Costs



²¹In what follows, we focus on the total immigrant population rather than attempting estimates of the Central and South American immigrant population in particular. This is in large measure due to small sample difficulties associated with highlighting particular immigrant groups in the PUMS data system. However, since most of the immigrant population does come from Central and South America, the total numbers presented here are likely reasonably close to those of the specific immigrant group.

Table 13. Fiscal Contributions and Costs

	Foreign born	Native born
Contributions (\$ millions)		
Property taxes ¹	\$39.80	\$1,055.38
Income taxes (state) ¹	\$73.57	\$1,393.74
Sales taxes ²	\$34.07	\$661.65
Gasoline taxes ²	\$7.21	\$132.67
Total	\$154.65	\$3,243.43
Share	4.55%	95.45%
Costs (\$ millions)		
Food stamps ¹	\$6.83	\$66.06
Public Assist. ¹	\$6.25	\$163.85
Health Exp. ³	\$38.73	\$403.85
Education ⁴	\$92.97	\$2,605.53
Total	\$144.78	\$3,239.29
Share	4.28%	95.72%
Contributions per capita (\$)¹	\$1,554.27	\$1,943.53
Costs per capita (\$)¹	\$1,455.11	\$1,941.05
Ratio of contributions to costs	1.07	1.00

¹Source: US Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

²Source: Author's calculations based on data from *Consumer Expenditures in 2005*, Report 998, U.S. Department of Labor, US Bureau of Labor Statistics.

³Source: Author's calculations based on PUMS demographic data as well as from the Medical Expenditure Panel Survey for the year 2000, US Department of Health and Human Services. Retrieved on February 26, 2008 (http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml).

⁴Source: Author's calculations based on PUMS demographic data as well as from the Annual Financial Report, Education Support Services, Nebraska Department of Education. Retrieved March 5, 2008 (<http://ess.nde.state.ne.us/SchoolFinance/AFR/StatwidePPC.htm>).

Fiscal Contributions

The primary source of state (and local) fiscal contributions come from income taxes paid to the state, property taxes paid to local governments, sales taxes paid to the state, and energy (gas) excise taxes paid to the state (see Table 13). The property tax data from the PUMS data system indicate that in 2006, the total foreign-born group paid \$39.8 million to local governments. The corresponding native-born group paid \$1.055 billion; the difference can largely be attributed to a greater number of households whose

head of household is native born.²² Foreign-born wage earners contributed an estimated \$73.6 million to the state of Nebraska in the form of state income tax, as compared to \$1.39 billion for the corresponding native-born population; again the difference reflects the larger number of wage and salary earning native-born workers in the state.²³

Sales tax estimates are based on expenditure data available from the US Bureau of Labor Statistics' Consumer Expenditure Survey, 2005, the latest

²²According to the PUMS, in 2006 the number of foreign-born heads of households who paid property taxes in Nebraska was 18,933. By contrast, the total number of native-born heads of households in the state who paid property taxes in 2006 was 453,305.

²³These figures were based on the income data supplied in the PUMS data system, where an average state tax rate of 4.02 percent was applied (see Appendix B). It should be noted that these income tax figures likely understate the impact of immigrants' overall income (and sales) tax revenue since these figures are based only on direct income. They do not include the tax benefits from the increase in income generated through the indirect and induced expenditure effects.

estimates available. These data provide a breakdown of expenditures on various consumer items such as food, clothing, gasoline, and so forth. From these data, we identified those consumption categories subject to a state (and local) sales tax and calculated this group's share of total expenditures.²⁴ We then applied this share to our estimate of after-tax and remittances income data from the PUMS. These figures suggest that the immigrant population paid \$34.1 million in sales taxes in 2006.²⁵ Using a similar procedure for gasoline consumption, and applying an excise tax of 25 cents per gallon, we estimate gasoline tax contributions of \$7.2 million. These figures compare to \$661.6 million in sales tax revenue and \$132.7 million in gasoline tax revenue generated by the native-born population.²⁶

The total native-born contribution based on these measures is estimated to be \$3.24 billion for 2006 (about 95.4 percent of total estimated contributions). The corresponding contribution from immigrant groups is \$154.7 million (about 4.6 percent of total estimated contributions). Again, the dollar difference is largely reflective of the greater number of native born in the state's population. The percentage figures indicate that while the immigrant population comprises about 6 percent of the working age population in the state, they contribute less in percentage terms. This is primarily because the average immigrant's income level is less than that of the native-born group.

Public Costs

Table 13 also shows estimates for public cost categories. These categories include funding for the state's food stamp program, state expenditures for public assistance and supplementary security income, the state cost of providing health services, and the state cost of kindergarten through high school (K-12) education.

The food stamp and public assistance data come from the PUMS system. The estimates indicate that in 2006,

the state spent \$6.8 million and \$6.3 million on food stamps and public assistance to the state's immigrant population, respectively. For the larger native-born population these estimates are \$66.1 million and \$163.9 million, respectively.

Furthermore, estimates of state-supported health services for 2006 are \$38.7 million for the state's immigrant population and \$403.9 million for the native population.²⁷ Moreover, educational expenditures for the immigrant population are estimated to be \$93.0 million as of 2006, as compared to expenditures for the larger native population of \$2.61 billion.

Based on these categories, the total native-born costs are estimated to be \$3.24 billion for 2006 (about 96.0 percent of total estimated costs). The corresponding cost figure for the immigrant group is \$136.4 million (about 4.0 percent of total estimated costs). Again, this 4 percent is less than the immigrant working age population share of roughly 6 percent. This in large measure reflects the fact that such groups tend to spend proportionately less of their income on health care.

An alternative way of viewing these figures is to consider costs and contributions on a per capita basis.²⁸ As shown in Table 11, the average contribution per capita for immigrants is \$1,554.27. For the native population, this average is \$1,943.53. The average cost per capita for the immigrant group is \$1,455.11 as compared to \$1,941.05 for the native group. The ratio of contributions to costs is 1.07 for the immigrant group as compared to 1.00 for the native group. This indicates that while there is some balance between contributions and costs on the native-born side, on the immigrant side, contributions exceed costs by about 7 percent. This result is consistent with other published work for immigrant populations in other states.²⁹

²⁴See Appendix C for additional information.

²⁵The state sales tax is 5.5 percent. In addition, we added, for expenditures occurring in Douglas and Sarpy counties, an additional municipal (Omaha) sales tax of 1.5 percent.

²⁶See Appendix C for details.

²⁷These data were constructed using demographic data from the PUMS and data from the US Department of Health and Human Services' Medical Expenditure Panel Survey for the year 2000. These data can be found at http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml. We used a medical services expenditures price deflator from the US Bureau of Labor Statistics to calculate the 2006 estimates. For details, see Appendix C.

²⁸To construct these per capita terms, we divided the total costs (expenditures) for each group by their corresponding total population count as estimated in PUMS.

²⁹See, for instance, Garvey, Espenshade, and Scully (2002).



Photo by Rudy Smith, Baba Gomez Heritage Elementary School

Conclusion and Future Research

This study has attempted to quantitatively measure the impact of the state's immigrant population on Nebraska, with some attention paid to Latin American immigrant groups. Several key results arise from this analysis.

First, on the demand or expenditure side of the state's economy, in 2006, immigrant spending resulted in \$1.6 billion worth of total production to Nebraska's economy, with a possible range between \$1.5 billion to \$1.7 billion. Moreover, this spending generated between 11,874 and 12,121 jobs in total for the state. The 2006 total production impact of Central and South American immigrant spending was \$717 million (with a possible range between \$653 million and \$792 million), accounting for between 4,923 and 5,971 jobs in the state. The total value of production impact of immigrant spending in Nebraska's Omaha and Lincoln areas was \$1.14 billion in 2006, resulting in 8,331 jobs. The impact of immigrant spending on total production in Nebraska's Eastern region was \$204 million, resulting in 1,275 jobs. Finally, the impact of immigrant spending on total production in Nebraska's Western region was \$238 million, resulting in 1,896 jobs.

On the supply or production side of the state's economy, Nebraska's immigrant population makes substantial contributions to the labor force in some of the state's key economic sectors: construction, hotel and food services, and meat, poultry, and fish processing. The immigrant labor force accounted for 9.65 percent of total employment in construction in 2006, 7.3 percent of total employment in the services sector, and 80.4 percent in meat processing.

To measure these contributions, we conducted counterfactual experiments by addressing what would happen were this labor force unavailable in these key sectors. We found that total state production would fall by \$13.5 billion if the total immigrant population were not present in these three key sectors (and with no absorption by domestic labor), about 8.75 percent of total state production. If just the Central and South American immigrant population were removed from these sectors, the resulting loss to the state would be \$11.4 billion, or 7.9 percent of total state production. Total production losses in the state's Tri-County area would be \$5.4 billion. Losses would amount to \$3.9 billion and \$2.8 billion in the state's Eastern and Western regions. These losses would represent

significant declines in these regions' employment as well. For instance, in the state's Tri-County region, total job losses could be as high as 35,140, or about 6.5 percent of total jobs in the region.

Losses to the state and regional economies would be smaller if sufficient job replacement occurred. Even so, losses would be nontrivial. For instance, if 75 percent of the jobs vacated by immigrant labor were replaced by domestic labor, this would result in \$3.366 billion in lost production and 19,518 jobs would disappear.

Finally, on the fiscal side of the equation, we found that the state's immigrant population does not necessarily place more pressure on public goods than it offers in terms of tax revenue. The state's immigrant population contributed about \$154 million in the form of property, income, sales, and gasoline tax revenue in 2006. This amounts to about \$1,554 in per capita contributions. By contrast, the state's corresponding per capita contributions from the native-born population are about \$1,944. In terms of government costs, the immigrant population in Nebraska accounted for \$144.78 million from food stamps, public assistance, health, and educational expenditures in 2006. This amounts to about \$1,455 per capita. By contrast, the corresponding per capita costs from the native-born population are about \$1,941.

While the contribution to cost ratio is 1.0 for the native population, the corresponding ratio for the immigrant group is 1.07, indicating that that this group "pays in" about 7 percent more of what it uses in terms of governmental support. This result appears in line with some recent evidence suggesting that immigrant populations can in fact generate a fiscal surplus to state and local governments.

While this study has utilized the most recent and reliable data available and one of the most detailed and commonly employed modeling platforms (i.e., IMPLAN) to measure the economic impact of immigrant populations on the state of Nebraska, the study has some limitations that suggest a number of fruitful avenues for future research. Several such extensions are discussed below.

First, the fiscal surplus generated by immigrant populations, while consistent with existing literature, is worth further investigation. Much of this surplus

can be attributed to the fact that these populations place less pressure on health services. Indeed, many studies have documented that in the United States the foreign born are much more likely to go without health insurance and, as a consequence, are less likely to seek such services than the native-born population. The reason for this appears to go beyond income and occupation. A recent study by Pol, Adidam, and Pol (2002) found that immigrant populations are twice as likely to go without health insurance as are their native-born counterparts—*even after controlling for income and employment status*. Hence, there may be other social and cultural factors at play that might help guide a more complete understanding of the fiscal evidence presented in this report.

Second, the issue of documented versus undocumented immigrant populations is an important, and quite heated, political and legal debate, both regionally and nationally. From an economic impact perspective, the issue is, at best, difficult to address. First, reliable data are hard to come by, particularly at a substate level. Second, numerical information on income, expenditures (for both public and private goods and services), and occupation is generally not available. Hence, constructing an economic impact is hard to conceptualize. Moreover, even if reliable estimates were available, it is questionable whether the existing modeling platform (i.e., the IO model structure) would provide any additional insight relative to what is already presented here. For instance, in a 2005 Pew Hispanic Center report titled "Estimates of the Size and Characteristics of the Undocumented Population," between 2002 and 2004 Nebraska is estimated to have had between 20,000 and 35,000 undocumented immigrants in the state (between 28 and 49 percent of the foreign-born population from the PUMS data). Assuming that these immigrants have similar incomes and exhibit the same spending habits as the immigrant population investigated in this report, then the expenditure multipliers will be the same. Hence, the total dollar impacts will largely reflect a simple percentage of the figures presented in Table 4. Similarly, if this undocumented group is employed in jobs similar to those of documented immigrants, then again, the multipliers will be the same and the total employment impacts will largely reflect a percentage of those figures presented in Table 11. In short, from the economic impact perspective, there may be little to gain from focusing on the undocumented immigrant

group unless more reliable detailed income and expenditure data can be found to refine any direct effect measurements.

The fiscal impact may be a useful avenue for future research; however, even here the fiscal estimates presented earlier in this study might still reasonably reflect the undocumented immigration experience. As Pearson and Sheehan (2007) articulate, undocumented immigrants do pay property, sales, and income taxes. Moreover, like their documented counterparts, these populations also tend to access the medical care system at rates much lower than native-born citizens. Hence, the fiscal picture presented in Table 13 may be illustrative of the undocumented population as well. Nevertheless, there are still too many unknowns about the nature and extent of the undocumented immigrant population to draw any definitive conclusions, thus more research may be in order.

Third, the nature of this study and the modeling platform employed are such that the results provide only a “snapshot” of the immigrant population’s impact on the state of Nebraska in 2006. The analysis is thus static in nature and does not offer a dynamic picture of how this population may change over time or how occupational mobility or production processes may evolve.

Input/Output (IO) models are often referred to as “fixed proportion” production models, meaning that production requires a fixed proportion of a set of inputs to generate a given level of production. For instance, to produce one dollar’s worth of processed meat, fish, or poultry requires 35 cents worth of labor, 3 cents worth of electricity, etc. There are two important characteristics of these models. First, the proportions will not respond to changes in factor input prices. Hence, if the production of a dollar’s worth of processed meat, fish, or poultry requires 35 cents’ worth of labor, that proportion (i.e., 35 percent) is fixed and will not change as labor costs change. Second, these proportions do not change over time. In short, there is no input substitution in IO models. This can be a limiting factor in a dynamic impact analysis. For instance, if there were sufficient increases in automation in the meat, fish, and poultry processing industries over time, resulting in lower labor demand, the IO model would not adjust to this new production mix. The resulting production and employment multipliers

would thus tend to overstate labor’s contribution to production. This could have significant implications for the future direction of immigrant labor in certain sectors. Indeed, increased automation in meat, fish, and poultry processing is quite prevalent, as evidenced by a new, highly automated meat processing plant in northeast Nebraska near Sioux City, Iowa. To account for such input substitution would require a much more complex model in which such substitution is possible.

Fourth, IO models, by their very construction, assume fixed prices, including factor prices such as wage rates. This in effect implies that there are no meaningful resource constraints in an economy. Hence, if there is an increase in final demand for some good or service, it is assumed that sufficient resources (including labor) are available to meet that additional demand. In an environment with limited resources, then one would expect a corresponding change in price. For example, if demand for meat, fish, and poultry increased, then there would be a corresponding increased labor demand in this sector. If a significant amount of surplus labor were available, then one would anticipate no change in wages and thus no upward pressure on meat, fish, and poultry prices. However, if only a limited amount of surplus labor were available, then one would expect an increase in wages and thus some inflationary pressure on meat, fish, and poultry goods and, in turn, inflationary pressure further down the supply chain as well.

As indicated earlier in this report, the existing literature linking wage increases/decreases to immigration flows is largely inconclusive, and therefore there may be little bias in the results generated by the IO model in this study. However, as also indicated earlier, labor market dynamics are quite complex and the Nebraska experience may differ markedly from results published in the literature. It may, then, still be fruitful to investigate specific labor markets within the state to see if wages are sensitive to immigrant population levels. In addition, if such a link does exist, it would be worth investigating how much changes in wages impact consumer prices for goods and services in the Nebraska economy. Moreover, with such labor market adjustments, one could also construct reasonable projections for the Nebraska economy and the role immigration will likely play. These and other considerations are left for future research.

Bibliography

Borjas, George J. 2003. "The Labor Demand Curve Is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market." *Quarterly Journal of Economics* 118: 1335-1374.

Card, David. 2005. "Is the New Immigration Really So Bad?" *Economic Journal* 115: 300-323.

Castles, Stephen, and Mark J. Miller. 2003. *The Age of Migration: International Population Movements in the Modern Age*. New York: Gilford Press.

Ezzati-Rice, Trena, David M. Kashihara, and Steven R. Machlin. 2000. *Medical Expenditure Panel Survey: Research Findings #21: Health Care Expenses in the United States, 2000*. Washington, DC: United States Department of Health and Human Services.

Fiscal Policy Institute. 2007. *Working for a Better Life: A Profile of Immigrants in the New York State Economy*. New York, NY. November.

Gans, Judith. 2007. *Immigrants in Arizona: Fiscal and Economic Impacts*. Tucson: Udall Center for Studies in Public Policy, University of Arizona.

Garvey, Deborah L., Thomas J. Espenshade, and James M. Scully. 2002. "Are Immigrants a Drain on the Public Fisc? State and Local Impacts of New Jersey." *Social Science Quarterly* 83: 537-553.

Gouveia, Lourdes. 2006. "Nebraska's Responses to Immigration." In Greg Anrig, Jr., and Tova A. Wang, eds., *Immigration's New Frontiers. Experiences from the Emerging Gateway States*. New York: Century Foundation Press.

Gouveia, Lourdes and Rogelio Saenz. 2000. "Global Forces and Latino Population Growth in the Midwest: A Regional and Sub-regional Analysis." Special Issue on "The Latino Experience in the Great Plains," *Great Plains Journal* 10(2): 305-328.

Hewings, Geoffrey J. D. 1986. *Regional Input-Output Analysis*. Beverly Hills, USA: Sage Publications.

Hoover, Edgar M., and Frank Giarratani. 1984. *An Introduction to Regional Economics*, 3rd ed. New York: Alfred A. Knopf.

James, Franklin J., Jeff A. Romine, and Peter E. Zwanzig. 1998. "The Effects of Immigration on Urban Communities." *Citiscap: A Journal of Policy Development and Research* 3: 171-192.

Kasarda, John D., and James H. Johnson, Jr. 2006. *The Economic Impact of the Hispanic Population on the State of North Carolina*. Chapel Hill: University of North Carolina, Frank Hawkins Kenan Institute of Private Enterprise.

Leontief, Westley. 1936. "Quantitative Input and Output Relations in the Economic System of the United States." *Review of Economics and Statistics* 18: 105-125.

Massey, Douglas S., Jorge Durand, and Nolane J. Malone. 2006. *Beyond Smoke and Mirrors. Mexican Immigration in an Era of Economic Integration*. New York: Russell Sage Foundation.

Mouhammed, Adil H. 2000. *Quantitative Methods for Business and Economics*. Armonk, NY: ME <or M.E.>Sharpe.

- Murray, Julie, Jeanne Batalova, and Michael Fix. 2006. "The Impact of Immigration on Native Workers: A Fresh Look at the Evidence." *Insight, Migration Policy Institute*, Washington, DC, 18: 1-26.
- Passel, Jeffrey, S. 2005. *Estimates of the Size and Characteristics of the Undocumented Population*, 21 March. Washington, DC: Pew Hispanic Center. Available online: <http://pewhispanic.org/files/reports/44.pdf> (accessed May 22, 2008).
- Pearson, Beth, and Michael F. Sheehan. 2007. *Undocumented Immigrants in Iowa: Estimated Tax Contributions and Fiscal Impact*. Mount Vernon, IA: Iowa Policy Project. Available online: <http://www.iowapolicyproject.org/2007docs/071025-undoc.pdf> (accessed May 22, 2008).
- Pedace, Roberto. 2006. "Immigration, Labor Market Mobility and the Earnings of Native-Born Workers. An Occupational Segmentation Approach." *American Journal of Economics and Sociology* 65 (2): 313-345.
- Pol, Louis G., Phani Tej Adidam, and Janet T. Pol. 2002. "Health Insurance Status of the Adult, Nonelderly, Foreign-Born Population." *Journal of Immigrant Health* 4: 103-109.
- Portes, Alejandro, and Ruben G. Rumbaut. 2006. *Immigrant America*. Berkeley: University of California Press.
- Raa, Thijs Ten. 2005. *The Economics of Input-Output Analysis*. Cambridge, UK: Cambridge University Press.
- United States Department of Labor, US Bureau of Labor Statistics. 2007. *Consumer Expenditures in 2005*. Report No. 998. February.
- Waldinger, Roger, and Jennifer Lee. 2001. "New Immigrants in Urban America." In Roger Waldinger, ed., *Strangers at the Gate. New Immigrants in Urban America*. Berkeley: University of California Press.
- Yan, Chiou-shuang. 1969. *Introduction to Input-Output Economics*. New York: Holt, Rinehart, and Winston, Inc.

Appendix A:

American Community Survey Public Use Microdata Sample

The Public Use Microdata Samples (PUMS) are a sample of the actual responses to the US Census Bureau's annual American Community Survey (ACS) and include most population and housing characteristics found in ACS as well as the ten-year censuses. These files provide users with the flexibility to prepare customized reports and datasets useful for geographically and demographically detailed research and analysis.

The ACS is a nationwide survey designed to provide current and accurate information every year about demographic, socioeconomic, and housing characteristics. There are more than 60 questions on the ACS, and they are comparable to those on the Census 2000 long form. PUMS files from the American Community Survey show the full range of responses made on individual questionnaires, including income, occupation, and industry of employment. The files contain records for a sample of all housing units and group quarters, with information on the characteristics of each housing unit and the people in the housing unit or group quarter.

Nationally, the American Community Survey is mailed to about 250,000 housing units each month, totaling 3 million annually. This comes to about a 1 in 40 sample of all the housing units in the nation. In addition to the housing units, the ACS includes approximately 1 in 40 persons living in group quarters. For Nebraska in 2006, the Census Bureau received completed interviews from 18,307 housing units and 1,036 people living in group quarters

The records selected for the PUMS are a sample of those housing units and group quarter persons that completed the questionnaire. The sample consists of approximately 1 percent of the housing units and 1 percent of the persons residing in group quarters. In 2006, the PUMS for Nebraska included 7,749 housing units and 521 persons in group quarters. Combining the persons in housing units and those in group quarters,

the total number of persons in the sample was 18,063. Individual responses are given a weight so that the weighted values will estimate the characteristics of the total population.

As is the case for every sample survey, the PUMS is subject to two types of error: sampling error and nonsampling error. Sampling error results from using a sample of persons to estimate the characteristics of a population. Probability sampling allows us to conduct statistical analyses of sample data. All other things being equal, the larger the number of people included in the sample, the smaller the sampling error. Therefore, in this report, our analyses were limited if the unweighted number of persons included in the sample was too small.

Nonsampling errors are unknown and may affect the data in two ways. Some non-sampling errors are introduced randomly because of data entry or editing errors. These errors increase the variability of the data. Systematic errors, which are in one direction, introduce bias into the results of a sample survey and may result from the failure to obtain measurements from sampled housing units (nonresponse). The Census Bureau tries to minimize the effect of these systematic errors on survey estimates through sampling techniques, questionnaire design, and data collection and processing procedures. For more information, the reader is referred to the US Census Bureau's web page at http://factfinder.census.gov/home/en/acs_pums_2006.html.

The PUMS includes detailed country of origin information within its sample. We used this information to aggregate foreign born Nebraska residents who came from Central and South American countries, including, among others, Mexico, Cuba, Jamaica, and the Dominican Republic. Our total foreign born group includes both those from Central and South America as well as the rest of the world. Table A1 identifies the country of origin for the delineations used in this study.

Table A1: Place of Birth - Country Breakdown

Central & South American Origin		Rest of World			
		Europe & Canada		Asia & Middle East	Africa, Australia and Pacific Islands
Mexico	St. Kitts-Nevis	Canada	Spain	Afghanistan	Algeria
Bermuda	St. Lucia	Albania	Sweden	Bangladesh	Cameroon
Belize	St. Vincent & the Grenadines	Austria	Switzerland	Myanmar	Cape Verde
Costa Rica	Trinidad & Tobago	Belgium	England	Cambodia	Egypt
El Salvador	West Indies	Bulgaria	Scotland	China	Ethiopia
Guatemala	Argentina	Czechoslovakia	Northern Ireland	Hong Kong	Eritrea
Honduras	Bolivia	Denmark	Yugoslavia	India	Ghana
Nicaragua	Brazil	Finland	Czech Republic	Indonesia	Guinea
Panama	Chile	France	Slovakia	Iran	Kenya
Antigua & Barbuda	Colombia	Germany	Bosnia & Herzegovina	Iraq	Liberia
Bahamas	Ecuador	Greece	Croatia	Israel	Morocco
Barbados	Guyana	Hungary	Macedonia	Japan	Nigeria
Cuba	Paraguay	Iceland	Estonia	Jordan	Senegal
Dominica	Peru	Ireland	Latvia	Korea	Sierra Leone
Dominican Republic	Uruguay	Italy	Lithuania	Kazakhstan	Somalia
Grenada	Venezuela	Netherlands	Armenia	Kuwait	South Africa
Haiti		Norway	Azerbaijan	Laos	Sudan
Jamaica		Poland	Belarus	Lebanon	Tanzania
		Portugal	Georgia	Malaysia	Uganda
		Azores Islands	Moldova	Nepal	Zimbabwe
		Romania	Russia	Pakistan	Fiji
			Ukraine	Philippines	Micronesia
				Saudi Arabia	New Zealand
				Singapore	Tonga
				Sri Lanka	Samoa
				Syria	
				Taiwan	
				Thailand	
				Turkey	
				Uzbekistan	
				Vietnam	
				Yemen	

Appendix B: Calculation of After-Tax and Remittances Income

After-Tax Income

To calculate after-tax income, we generated an effective federal and state income tax rate by using mean income measures for our demographic groups and applied various marginal tax rates as supplied by a variety of sources on marginal tax rates. We obtained data on federal marginal tax rates from the following web site: http://www.moneychimp.com/features/tax_brackets.htm, verified through US Internal Revenue Service sources, and for the state of Nebraska we used information found at the Nebraska State Department of Revenue at <http://www.revenue.state.ne.us/>. The rates are provided below:

Table B1. Tax Rates

Federal Rates		State Rates	
Income range	Rate	Income range	Rate
\$0-\$10,750	10%	\$0-\$2,400	2.56%
\$10,750-\$41,050	15%	\$2400-\$17,000	3.57%
\$41,050-\$106,000	25%	\$17,000-\$26,500	5.12%
\$106,000-\$171,650	28%	\$26,500-over	6.84%
\$171,650-\$336,550	33%		
\$336,550-above	35%		

Source: For the federal tax rates, information was retrieved on February 2, 2008 (http://www.moneychimp.com/features/tax_brackets.htm). For the state tax rate data, information was retrieved on February 2, 2008 (<http://www.revenue.state.ne.us/>).

We then applied these tax rates to various levels of income up to the level of mean personal income. The resulting tax rates were between 12.5 and 13.3 percent for federal tax deductions and between 3.8 and 4.5 percent for state tax deductions, depending on demographic group.

An additional income deduction is the payroll tax. While there is significant debate among economists regarding who bears the greater burden of the payroll tax, which requires contributions from both employers and employees (the total of which is about 15.3 percent), we follow convention and apply 7.65 percent to employees' income.

Applying these three deductions gives us a measure of after-tax income. For example, consider the total immigrant group in Nebraska, which as a whole earned \$1,829,570,880.00 in wages and salaries in 2006. The after-tax income is estimated to be:

$$\begin{aligned} \$1,829,570,880.00 * (1 - \text{Taxfed} - \text{Taxstate} - \text{Taxpayroll}) &= 1,829,570,880.00(1 - 0.1293 - 0.0402 - 0.0765) \\ &= \$1,379,457,476.63. \end{aligned}$$

Remittances

Once these after-tax figures are calculated, we need to deduct the income that immigrant populations send to their region of origin, i.e., remittances, as these represent a leakage from the local economy and should not then be used as direct inputs into IMPLAN. For Central and South American remittances, we employed data from the Inter-American Development Bank (the data can be found at the following web page: http://www.iadb.org/mif/remesas_usamap.cfm?language=english). For the Central and South American populations, it was estimated that \$154 million was remitted to country of origin in 2006, representing about 23 percent of after-tax income for the immigrant populations from Central and South American countries. For immigrant populations from other

regions of the world, we employed data from the World Bank's "Migration and Remittances Factbook, 2008," which can be found at:

<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21352016~isCURL:Y~menuPK:3145470~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>

This data is available only for the US as a whole so we calculated a remittances share of total US disposable income and applied that share to the Nebraska income figures. The remittance levels are smaller, accounting for about 1.3 percent of after-tax income. To calculate the overall remittance rate for all immigrant populations in the state of Nebraska, we calculated a population share weighted average of the remittance rates for Central and South American populations and the rest of the immigrant population. To calculate these population shares, we used the population aged 16 and over since these are the groups in the labor force likely earning income. This calculation then is as follows:

$$23*(\text{Cent. \& South Am./Total Imm.}) + 0.013*(\text{Rest of World/Total Imm.}) =$$

$$.23*(40,382.00/69,844.00) + 0.013*(29,462.00/69,844.00) = .14$$

Given that most of the immigrant population, about 58 percent of the foreign-born population aged 16 and over, comes from Central and South America, the overall remittance rate is closer to the higher-end estimate, representing about 14 percent of after-tax income.

Table B2 below provides a summary of the tax and remittances calculations on the PUMS income data.

Table B2. Earnings and After-Tax and Remittances Income					
	Total Earnings (\$ millions)	Effective Tax Rate (Federal and State Income+Payroll)	After Tax Income (\$ millions)	Remittances (%)	After Tax and Remittances Income (\$ millions)
Nebraska					
Native Born	\$31,033.52	25.43%	\$23,141.96		
Foreign Born	\$1,829.57	25.43%	\$1,379.46	13.85%	\$1,188.38
Central & South American Born	\$881.34	23.97%	\$670.10	22.98%	\$516.10
Tri-County					
Native Born	\$17,472.18	25.88%	\$12,951.14		
Foreign Born	\$1,272.94	24.91%	\$955.84	13.85%	\$823.44
Eastern					
Native Born	\$6,838.82	24.90%	\$5,136.14		
Foreign Born	\$265.34	23.80%	\$202.18	13.85%	\$174.17
Western					
Native Born	\$6,722.52	24.81%	\$5,054.67		
Foreign Born	\$291.30	24.40%	\$220.21	13.85%	\$189.71

Source: Author's calculations based on income data from PUMS and remittances data from the Inter-American Developmental Bank, retrieved March 20, 2008

(<http://www.iadb.org/mif/remittances/usa/>), and the World Bank's "Migration and Remittances Factbook, 2008, retrieved March 21, 2008

(<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21352016~isCURL:Y~menuPK:3145470~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>).

Appendix C: Calculations of Public Contributions and Costs Estimates

Contributions

As indicated in the text, the property tax data came from the PUMS. The state income tax figures were calculated using the state tax rate figures calculated in Appendix B.

The sales tax figures were based on expenditure shares on certain key consumer spending categories as defined by the US Bureau of Labor Statistics' *Consumer Expenditure Survey*, 2005, published in 2007. These categories were: food away from home, alcoholic beverages, utilities fuels and public services, household operations, housekeeping supplies, household furnishings and equipment, apparel and services, vehicle purchases (net outlay), other vehicle expenses, entertainment, personal care products and services, tobacco products and smoking supplies, and miscellaneous items. This was done for the immigrant group based on Hispanic spending patterns as published in the Consumer Expenditure Survey, and for the total native group based on household incomes ranging between \$40,000 and \$60,000 per year, also in the BLS publication. The state sales tax is 5.5 percent. In addition, we added, for expenditures occurring in Douglas and Sarpy counties, an additional municipal (Omaha) sales tax of 1.5 percent.

The gasoline consumption tax figures were calculated as follows. Based on data from the BLS's *Consumer Expenditure Survey*, about 5 percent of total expenditures in 2005 were gasoline expenses. We calculated what 5 percent of total after-tax income would be to determine the gasoline expenditure figure for Nebraska's various demographic groups of interest. We then calculated total gallons consumed based on a price per gallon of \$2.23. This figure was, according to the US Department of Energy, Energy Information Administration (www.eia.doe.gov), the average per-gallon price for unleaded gasoline in 2006. We divided the gasoline expenditure figure by 2.23. The total gallons' figures were then multiplied by the state's 25 cents per gallon gas tax.

Costs

Public costs comprise four categories; food stamp expenditures, public assistance and supplementary income, education expenses, and public coverage of health care costs. The food stamp and public assistance and supplemental income come from the PUMS data system.

Educational expenditure estimates were constructed based on population data for native and immigrant groups aged 5 to 17 from PUMS. We obtained statewide per pupil from the Nebraska Department of Education. This data can be found on line at: (<http://ess.nde.state.ne.us/SchoolFinance/AFR/StatewidePPC.htm>). These data indicate that in 2005/2006 per-pupil expenditure was \$8,509.86. The immigrant population aged 5 to 17 in 2006 was 10,925 and total native population aged 5 to 17 was 306,178. Multiplying these figures by the above per-pupil expenditure results in the estimates reported.

The estimates are more complicated to construct. First, we obtained data from the US Department of Health and Human Services' Medial Expenditure Panel Survey for the year 2000. These data and the full report for the US can be found at the following web site: http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml. The data we used were for the US as a whole in the year 2000 and are in the table below:

Table C1. National Data From Medical Panel Survey, 2000

Age Group	Population (1000s)	% with an Expense	Total Expenses (\$ millions)	Expense per Person
Under 6	24,126	0.87	23,497.00	1,123.33
6 to 17	48,405	0.80	43,241.00	1,116.65
18 to 44	109,021	0.78	161,419.00	1,905.56
45 to 64	62,072	0.89	195,776.00	3,563.86
65 and over	34,782	1.00	203,964.00	5,893.54
Hispanic	33,955	0.70	41,770.00	1,749.87
Non hispanic	244,451	0.84	586,127.00	2,871.53

Source: U.S. Department of Health and Human Services' Medial Expenditure Panel Survey for the year 2000. Retrieved February 26, 2008 (http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml).

The expenses-per-person figures were then applied to the various demographic numbers for the state of Nebraska as estimated by the PUMS. Assuming then that these per-person costs are roughly equivalent to Nebraska's population, total expenses for immigrants and native-born groups were calculated by adding up each demographic cohort's estimated expenses. These figures are presented in Tables C2 and C3 below.

Table C2. Expenses Applied to Nebraska Population Data - Immigrants

Age Group	Expense per Person (from B1)	% with an Expense (from B1)	Nebraska Foreign Born	Total Expenses (\$ millions)
Under 5	\$1,123.33	0.87	1,308	\$1.27
5 to 17	\$1,116.65	0.80	10,925	\$9.76
18 to 44	\$1,905.56	0.78	62,664	\$92.78
45 to 64	\$3,563.86	0.89	19,269	\$60.77
65 and over	\$5,893.54	1.00	5,334	\$31.28
Total Expenses				\$195.87

Source: Author's calculations using PUMS.

For the immigrant population, certain adjustments were made to this total. First, as is clear from Table C1, the Hispanic population in the US spent per capita 61 percent of what the average US citizen spent in 2000. According to our PUMS data for 2006, Central and South American immigrants represent about 57 percent of total immigrants in Nebraska. Assuming that non-Central and South American immigrants tend to use health services as suggested by the US figures (i.e., the \$2,871.53 figure for Table C1), we generated an immigrant population weighted per capita expenditure figure by the following calculation:

$$0.57 * \$1,749.87 + (1 - 0.57) * \$2,871.53 = \$2,232.18$$

This figure represented about 78 percent of what the average US citizen spent in 2000. We then applied the 78 percent to the total immigrant population health expenditures of \$195.87 million from Table C2. This provided us with an estimate of \$152.3 million. Finally, evidence from the Medial Expenditure Panel indicates that the Hispanic population's use of Medicaid was 19.3 percent. Assuming this is a reasonable percentage in the state of Nebraska, we applied this percentage to the \$152.3 million figure to obtain \$29.4 million as our estimate of 2000 immigrant health expenditures in Nebraska.

To this figure we applied a Consumer Price Index (CPI) price deflator for health services as supplied by the US Bureau of Labor Statistics. For 2006, this deflator was 1.318. Since the base year is 2000, this index indicates that health service prices have increased almost 32 percent between 2000 and 2006. Applying this index to our \$29.4 million estimate gives us our 2006 health expenditure estimate of \$38.73 million.

Table C3. Expenses Applied to Nebraska Population Data - Native Born

Age Group	Expense per Person (from B1)	% with an Expense (from B1)	Nebraska Foreign Born	Total Expenses (\$ millions)
Under 5	\$1,123.33	0.87	126,999	\$123.69
5 to 17	\$1,116.65	0.80	306,178	\$273.51
18 to 44	\$1,905.56	0.78	588,011	\$870.62
45 to 64	\$3,563.86	0.89	419,702	\$1,323.75
65 and over	\$5,893.54	1.00	227,941	\$1,336.66
Total Expenses				\$3,928.23

Source: Author's calculations using PUMS.

Evidence from the Medical Expenditure Panel indicates that the total US population's use of Medicaid was 7.8 percent. Assuming again that this is a reasonable percentage in the state of Nebraska, we applied this percentage to the \$3.93 billion figure from Table C3 to obtain \$306.4 million as our estimate of 2000 total health expenditures in Nebraska.

To this figure we applied a Consumer Price Index (CPI) price deflator for health services. Applying this index to our \$306.4 million estimate gives us our 2006 health expenditure estimate of \$403.9 million.

Appendix D: Basic Input-Output (IO) Modeling and Derivation of IO Multipliers

Since their development in the mid-1930s, Input-Output (IO) models have been used extensively by economists and policy analysts to quantitatively measure the impact on an economy (either national or regional) from a variety of economic phenomena such as tax policy, pollution regulation, oil price spikes, military base closings, and industrial entry.

The main strength of the IO approach is that, with a primary focus on production, it recognizes that production processes are complex and that production of any given good or service requires production from other goods or services in the economy as inputs. Hence, it quantitatively measures the interdependency that exists among all industries in an economy. Something that impacts one market, for example, higher labor costs in the construction sector, will have subsequent impacts on many other sectors in the economy. Other regional models, such as Economic Base Theory, do not account for this interdependency. The magnitudes of these “ripple effects” are ultimately what determine the magnitudes of the various multipliers discussed in the text. The purpose of this appendix is to briefly describe the essential elements of an IO model from the perspective of where these multipliers come from. It is not designed to be a complete discussion of IO models in general.³⁰

In general, the following assumptions regarding IO models are made:

1. Each industry (i) produces only one homogeneous commodity or service (i).
2. Each industry uses a fixed input ratio (or factor combination) for the production of its output.
3. Production in every industry is subject to constant returns to scale, so that a k-fold increase in every input will result in a k-fold increase in output.

From these assumptions it will be the case that the production of one unit of the jth commodity requires a fixed proportion a_{ij} ($0 \leq a_{ij} < 1$) of the ith input.

The key to the IO model is the IO matrix, which incorporates these fixed proportions. Consider, for instance, the following (simplified) IO matrix (denoted as **A**):

		Output					
		1	2	3	...	n	
Input	1	a_{11}	a_{12}	a_{13}	...	a_{1n}	d_1
	2	a_{21}	a_{22}	a_{23}	...	a_{2n}	d_2
	3	a_{31}	a_{32}	a_{33}	...	a_{3n}	d_3

	n	a_{n1}	a_{n2}	a_{n3}	...	a_{nn}	d_n
		v_1	v_2	v_3	...	v_n	

The *columns* of this matrix represent the input requirements from industries 1, 2, 3,...n needed for the production of commodity 1. Hence, to produce x_1 units of commodity 1 requires as inputs the proportions of other commodities in the matrix: $a_{21}x_1$, $a_{31}x_1$, etc., as well as some primary input v_1 (a labor and/or capital input, for example). Algebraically, then, by reading down the first *column* of **A** we can describe a fixed proportions production function for commodity 1:

$$x_1 = a_{11}x_1 + a_{21}x_2 + a_{31}x_3 + \dots + a_{n1}x_n + v_1 \quad (D1)$$

³⁰For such a discussion, the reader is referred to Mouhammed (2000), Hewings (1986), and Hoover and Giarratani (1984).

The rows of this matrix can be used to determine the total output production necessary from a given industry to produce all the other commodities in the economy, as well as meet final (or end user) demand (households, for instance) for that given industry. For example, if industry 1 is to produce an output level sufficient to meet the input requirements of the n commodities as well as final demand, commodity 1's output level, x_1 , must be (reading across the first *row* of A):

$$x_1 = a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + \dots + a_{1n}x_n + d_1, \quad (\text{D2})$$

where d_1 is the final demand for commodity 1. To calculate the OI multipliers, we first solve (A2) for d_1 :

$$x_1(1 - a_{11}) - a_{12}x_2 - a_{13}x_3 - \dots - a_{1n}x_n = d_1. \quad (\text{D3})$$

We then do this same operation for the remaining industries comprising our economy. In so doing, we can represent the resulting system of equations compactly using matrix algebra notation:

$$(\mathbf{I} - \mathbf{A})\mathbf{x} = \mathbf{d}, \quad (\text{D4})$$

where \mathbf{x} is an $(n \times 1)$ output vector, \mathbf{d} is an $(n \times 1)$ final demand vector, and \mathbf{I} is an $(n \times n)$ identity matrix. The matrix $\mathbf{I} - \mathbf{A}$ is often referred to as the *technology matrix* and is critical to deriving IO multipliers. Notice that if we solve for our vector of industry output levels we obtain:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{d}, \quad (\text{D5})$$

where letting $\mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1}$, comprises a matrix of individual industry multiplier effects and therefore can be summed to obtain the total output (production) multiplier effect from an increase in a given final demand sector. To see this, expand (D5) and, for the sake of simplicity, assume only two sectors, 1 and 2. In so doing, we obtain:

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix} \begin{bmatrix} d_1 \\ d_2 \end{bmatrix}. \quad (\text{D6})$$

Using matrix multiplication, this system becomes:

$$\begin{aligned} x_1 &= b_{11}d_1 + b_{12}d_2 \\ x_2 &= b_{21}d_1 + b_{22}d_2 \end{aligned} \quad (\text{D7})$$

Notice now that the *direct* impact of a one-dollar increase in final demand in sector 1 yields a b_{11} dollar increase in output from x_1 . Notice further, however, that that same dollar increase in sector 1's final demand has an *indirect* impact equal to d_{21} dollars on sector 2's output. The total output multiplier (i.e., the total *direct* and *indirect* effects) from a one-dollar increase in sector 1's final demand is $b_{11} + b_{21}$. In general then, to determine the total output multiplier from an increase in final demand from a given sector i , we simply add up the elements in our \mathbf{B} matrix corresponding to the i th *column* in \mathbf{B} .

As stated above, the OI modeling framework has been and is currently used extensively in applied economic analysis because it has a number of desirable attributes that other model structures do not possess. However, there are some limitations as well. For completeness, these strengths and limitations are listed below.

Strengths of the IO modeling framework:

1. More industry detail than is typically provided in most regional econometric models.
2. The simultaneous nature of IO models allows for direct and indirect effects to be measured. Such feedback or ripple effects are generally not possible in most regional econometric models.
3. Ease and flexibility in simulation analysis.

Limitations of the IO modeling framework:

1. The coefficients in production are fixed in the IO matrix. This does not allow for input substitution in response to relative input price changes.
2. IO matrixes are usually developed accurately for a particular year. Over time, it is reasonable to assume the matrix coefficients to change, perhaps due to technological innovations in production or processing. However, this sort of flexibility is generally lacking in IO models.
3. The IO framework by construction imposes constant returns to scale for all industries in the economy.
4. IO models assume the same production technology (i.e., a single, linear production function) is used in a particular industry. This has two potentially troubling implications. First, it assumes that all firms within a particular market employ the same production technology, which may or may not be true in practice. Perhaps more troubling, however, is that often the definition of a “sector” may involve several relatively distinct industries. For instance, there exists an IO production function for the “Utility Sector.” However, this sector is comprised of electricity generation and electricity distribution, water supply systems, and natural gas production and distribution. It is unlikely that all of these industries would have the same production technology. Clearly then, more detail in an IO matrix is better than less. Unfortunately, cost and data limitations often limit the detail on most readily available models.

Office of Latino/Latin American Studies (OLLAS)
University of Nebraska at Omaha
www.unomaha.edu/ollas



EXHIBIT 22

National Employment Monthly Update

7/6/2018

National Unemployment Rate at 4.0 Percent Through June 2018

Approximately 213,000 jobs were created in June 2018, and the national unemployment rate rose from 3.8 to 4.0 percent, according to the Bureau of Labor Statistics. Employment increased in professional and business services, manufacturing, and healthcare, while the retail trade sector lost jobs.

Unemployment figures for July 2018 will be released on Friday, August 3, 2018.

NATIONAL UNEMPLOYMENT RATES | 2008 - 2018

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.
2018	4.1	4.1	4.1	3.9	3.8	4.0					
2017	4.8	4.7	4.5	4.4	4.3	4.4	4.3	4.4	4.2	4.1	4.1
2016	4.9	4.9	5.0	5.0	4.7	4.9	4.9	4.9	5.0	4.9	4.8
2015	5.7	5.5	5.5	5.4	5.5	5.3	5.3	5.1	5.1	5.0	5.0
2014	6.6	6.7	6.7	6.3	6.3	6.1	6.2	6.1	5.9	5.8	5.8
2013	7.9	7.7	7.5	7.5	7.5	7.5	7.3	7.2	7.2	7.2	7.0
2012	8.3	8.3	8.2	8.1	8.2	8.2	8.2	8.1	7.8	7.9	7.8
2011	9.0	8.9	8.8	9.0	9.1	9.2	9.1	9.1	9.1	9.0	8.8
2010	9.7	9.7	9.7	9.9	9.7	9.5	9.5	9.6	9.6	9.6	9.5
2009	7.6	8.1	8.5	8.9	9.4	9.5	9.4	9.7	9.8	10.2	10.0
2008	4.9	4.8	5.1	5.0	5.5	5.6	5.8	6.2	6.2	6.6	6.8

Source: Bureau of Labor Statistics

NCSL Member Toolbox

Members Resources

- Get Involved With NCSL
- Jobs Clearinghouse
- Legislative Careers
- NCSL Staff Directories
- Staff Directories
- StateConnect Directory
- Terms and Conditions

Policy & Research Resources

- Bill Information Service
- Legislative Websites
- NCSL Bookstore
- State Legislatures Magazine

Accessibility Support

- Tel: 1-800-659-2656 or 711
- Accessibility Support
- Accessibility Policy

Meeting Resources

- Calendar
- Online Registration

Press Room

- Media Contact
- NCSL In the News
- Press Releases

Denver

7700 East First Place
Denver, CO 80230
Tel: 303-364-7700 | [Facebook](#)

Washington

444 North Capitol Street
Washington, D.C. 20001
Tel: 202-624-5400 | [Facebook](#)

EXHIBIT 23

[Home](#)[Subjects](#)[Data Tools](#)[Publications](#)[Economic Releases](#)[Students](#)[Beta](#)

Databases, Tables & Calculators by Subject

SHARE ON: [f](#) [t](#) [in](#)

Change Output Options:

From: **2008** ▼To: **2018** ▼☒ include graphs☒ include annual averages[More Formatting Options](#) ➔

Data extracted on: July 19, 2018 (3:59:56 PM)

Job Openings and Labor Turnover Survey

Series Id: JTU54009900JOL

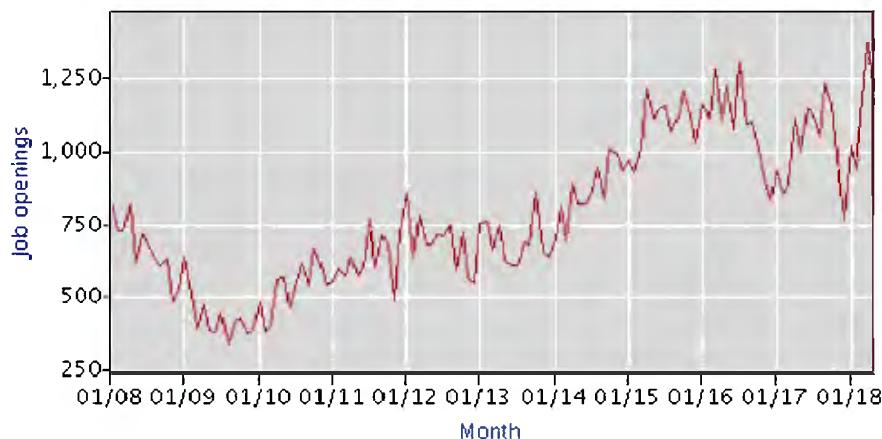
Not seasonally adjusted

Industry: Professional and business services

Region: Total US

Data Element: Job openings

Rate/Level: Level - In Thousands

Download: [xls](#) [xlsx](#)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	834	731	728	818	613	715	683	632	607	634	486	526
2009	638	515	395	470	388	382	449	343	415	432	376	391
2010	485	385	401	562	567	465	556	616	545	670	610	545
2011	556	595	572	637	574	604	771	603	713	679	491	721
2012	858	636	784	683	679	716	712	750	593	721	566	552
2013	751	761	666	745	630	609	609	687	682	862	655	642
2014	697	813	692	891	819	822	868	943	836	1010	994	935
2015	968	929	1014	1217	1111	1145	1156	1071	1115	1207	1123	1028
2016	1162	1112	1284	1110	1227	1080	1304	1097	1102	1009	924	839
2017	935	856	893	1112	997	1152	1126	1056	1235	1163	923	767
2018	1018	941	1118	1374	1221(P)							

P : preliminary

TOOLS[Areas at a Glance](#)[Industries at a Glance](#)**CALCULATORS**[Inflation](#)[Injury And Illness](#)**HELP**[Help & Tutorials](#)[FAQs](#)**INFO**[What's New](#)[Careers @ BLS](#)**RESOURCES**[Inspector General \(OIG\)](#)[Budget and Performance](#)

Economic Releases
Databases & Tables
Maps

Glossary
About BLS
Contact Us

Find It! DOL
Join our Mailing Lists
Linking & Copyright Info

No Fear Act
USA.gov
Benefits.gov

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Customer Survey](#) | [Important Web Site Notices](#)

U.S. Bureau of Labor Statistics | Postal Square Building, 2 Massachusetts Avenue, NE Washington, DC 20212-0001
www.bls.gov | Telephone: 1-202-691-5200 | TDD: 1-800-877-8339 | [Contact Us](#)

EXHIBIT 24

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 11281

The Economic Effects of Providing Legal Status to DREAMers

Francesc Ortega
Ryan Edwards
Amy Hsin

JANUARY 2018

DISCUSSION PAPER SERIES

IZA DP No. 11281

The Economic Effects of Providing Legal Status to DREAMers

Francesc Ortega

CUNY Queens College and IZA

Ryan Edwards

UC Berkeley

Amy Hsin

CUNY Queens College

JANUARY 2018

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ABSTRACT

The Economic Effects of Providing Legal Status to DREAMers*

This study quantifies the economic effects of two major immigration reforms aimed at legalizing undocumented individuals that entered the United States as children and completed high school: Deferred Action for Childhood Arrivals (DACA) and the DREAM Act. The former offers only temporary legal status to eligible individuals; the latter provides a track to legal permanent residence. Our analysis is based on a general-equilibrium model that allows for shifts in participation between work, college and non-employment. The model is calibrated to account for productivity differences across workers of different skills and documentation status, and a rich pattern of complementarities across different types of workers. We estimate DACA increased GDP by almost 0.02% (about \$3.5 billion), or \$7,454 per legalized worker. Passing the DREAM Act would increase GDP by around 0.08% (or \$15.2 billion), which amounts to an average of \$15,371 for each legalized worker. The larger effects of the DREAM Act stem from the expected larger take-up and the increased incentive to attend college among DREAMers with a high school degree. We also find substantial wage increases for individuals obtaining legal status, particularly for individuals that increase their educational attainment. Because of the small size of the DREAMer population, legalization entails negligible effects on the wages of US-born workers.

JEL Classification: D7, F22, H52, H75, J61, I22, I24

Keywords: immigration, DREAMers, legalization, undocumented

Corresponding author:

Francesc Ortega
Department of Economics
Queens College, CUNY
300A Powdermaker Hall
65-30 Kissena Blvd.
Queens, New York 11367
USA
E-mail: fortega@qc.cuny.edu

* The authors are grateful for financial assistance from the MacArthur Foundation. We thank Catalina Amuedo-Dorantes, Maryann Bertrand, Lorenzo Caliendo, Julen Esteban-Pretel, Fernando Lozano, Nuria Rodriguez-Planas, Thom Thurston, Bob Warren, and all seminar participants at San Diego State University, Pomona College and Queens College for helpful comments. All errors are our own.

1 Introduction

Approximately 11 million undocumented immigrants currently live in the United States. Having entered the country without authorization or overstayed their visas, they cannot legally work and live under the threat of deportation. Yet undocumented immigrants are responsible for about 3% of GDP nationwide and close to double that figure in states like California, Texas or Nevada (Edwards and Ortega (2017)).

Whether and how this population should be legally incorporated into the country is a source of great political debate. The last major immigration policy that offered legalization occurred nearly three decades ago under the 1986 Immigration Reform and Control Act (IRCA), which granted legal permanent residency to over 3 million undocumented immigrants (Orrenius and Zavodny (2016)). In the decades since IRCA's passage, the political climate has shifted rendering a general legalization process politically infeasible. The discussion has moved toward the less ambitious goal of providing legal status to undocumented youth who were brought to the United States as children, commonly known as DREAMers. This population continue to receive wide-spread public support, with some recent polls indicating that 86% of the American public would like to offer them legal residency.¹

Yet despite continued public support, Congress has failed to pass legislation offering a path to legal status for DREAMers. In 2010, the DREAM Act, bipartisan legislation offering eligible DREAMers pathways to permanent residence, passed the U.S. House of Representatives but failed to pass the U.S. Senate. In response, in June 2012, President Barack Obama enacted the Deferred Action for Childhood Arrivals (DACA) offering undocumented youth who arrived in the country as children reprieve from deportation and renewable 2-year work permits. On Tuesday, September 5, President Donald Trump rescinded DACA and urged Congress to explore a legislative solution.²

The goal of this paper is to quantify the economic effects of the two most recent immigrant policy reforms aimed at providing legal status to the DREAMer population – DACA and DREAM Act. We report estimates of the effects on GDP as well as on the wages of documented and undocumented workers. Our theoretical framework builds

¹Washington Post - ABC News, September 2017. https://www.washingtonpost.com/page/2010-2019/WashingtonPost/2017/09/25/National-Politics/Polling/release_491.xml

²To date, two new versions of the DREAM Act have been introduced and await congressional action. In the U.S. Senate, DREAM Act (S.1615) is a bipartisan bill that is co-sponsored by Senate Republicans Lindsey Graham and Jeff Flake and Senate Democrats Chuck Schumer and Dick Durbin. In the U.S. House, DREAM Act (HR.3440) is also a bipartisan bill that is co-sponsored by Republican Ileana Ros-Lehtinen and Democrat Lucille Roybal-Allard.

on the work of [Borjas \(2003\)](#), [Manacorda et al. \(2012\)](#), [Ottaviano and Peri \(2012\)](#) and [Edwards and Ortega \(2017\)](#). We develop a general-equilibrium model where production is carried out by means of a multi-level constant-elasticity of substitution production function, which allows for productivity differences across workers of different skills and documentation status, and a rich pattern of complementarities across them.

A novel feature of our framework is that we allow for shifts in participation between work, college and non-employment. This allows us to consider the effects of legalization policy on the college decisions of undocumented youth. Recent empirical studies have argued that DACA led to a substantial increase in the employment rates of DREAMers, driven by shifts from college enrollment into the workforce ([Amuedo-Dorantes and Antman \(2017\)](#) and [Hsin and Ortega \(2017\)](#)) and by shifts from unemployment into employment ([Pope \(2016\)](#)). Our analysis incorporates these effects and discusses the participation effects associated with the DREAM Act as well, which differ in the short and long runs.

To calibrate our model we rely on data from a special extract of the 2012 American Community Survey provided by the [Center for Migration Studies \(2014\)](#), which contains a sophisticated imputation for documentation status ([Warren \(2014\)](#)), in addition to the usual information on employment, skills and wages. Importantly, our 2012 baseline data summarize the economic outcomes of DREAMers immediately prior to DACA.³ The data show that, on average, documented workers earned 22% more than undocumented workers with the same education and age. This suggests there exists a large productivity penalty associated with undocumented status.

We use the calibrated model to simulate the effects of DACA and the DREAM Act relative to the baseline data. On account of the empirical evidence establishing that illegal status negatively affects the productivity of undocumented workers through its negative effects on health and labor market opportunities ([Abrego \(2011\)](#), [Gonzales \(2011\)](#), [Hainmueller et al. \(2017\)](#), [Hall and Greenman \(2015\)](#)), we assume that gaining legal status increases the productivity of undocumented workers so as to match the level of documented workers with the same age and education level.

Between its inception and June 2017, almost 800,000 individuals received DACA permits. Based on the actual take-up of the program, our analysis estimates that DACA increased GDP by 0.018% (about \$3.5 billion), or \$7,454 on average per employed DACA

³This is important because our data do not allow us to distinguish DACA recipients from non-recipients. As a result, data for the period when DACA was already in operation are likely to underestimate the undocumented wage penalty for DREAMers. DACA was approved in June 2012, but very few permits were granted prior to 2013.

recipient. Our analysis also shows that the wages of DACA recipients increased by around 12%, and that native wages were practically unaffected.

Turning now to the analysis of the DREAM Act, our data imply that there were 1.65 million undocumented that arrived in the country as children and had completed high school (by 2012) and therefore were eligible for legal status.⁴ It is important to note that the overall number of eligible individuals could be as high as 2.93 million if the DREAMers that do not yet have a high school degree obtain one. Our simulations suggest that the DREAM Act would increase GDP by 0.08% (i.e. \$15.2 billion annually), which amounts to \$15,371 per legalized worker. The reasons for the larger effects, compared to DACA, are the expected larger take-up rate and the increase in educational attainment among DREAMers with a high school degree that decide to obtain some college education in order to qualify for the DREAM Act. However, the positive effects on GDP will take several years to materialize. The reason is that, initially, the positive productivity effect of legalization on GDP will be offset by a negative participation effect driven by the return to college of a subset of DREAMers in the workforce. After a few years, these individuals rejoin the workforce with their enhanced skills, resulting in a substantial increase in GDP. Further, our analysis implies that the wages of most of the DREAMers that obtain legal status will increase by at least 15%, although those that decide to obtain some college education will experience an average 52% increase in wages. At the same time, we find that the DREAM Act will have very minimal effects on the wages of natives workers, ranging between 0.4% reductions and 0.4% increases.

The rest of the paper is organized as follows. [Section 2](#) contains the literature review. [Section 3](#) describes our data and [Section 4](#) presents our theoretical framework. [Section 5](#) describes the calibration of the model. Our findings are presented in [Section 6](#) (regarding DACA) and [Section 7](#) (regarding the DREAM Act). [Section 8](#) summarizes our conclusions.

2 Literature Review

A large body of literature has analyzed the labor market effects of immigration. However, the literature on the effects of legalization or the wage penalty associated with unauthorized status, is much smaller, and is almost exclusively reduced-form, which is

⁴We have restricted our sample to individuals older than 17 in year 2012. We also note that we do not have data on criminal records. As a result, some of these individuals may not satisfy the eligibility condition requiring a clean criminal record.

an important limitation in terms of simulating the effects of actual policies. Several studies have documented substantial wage gaps between similarly skilled documented and undocumented workers. For instance, [Hall et al. \(2010\)](#) estimated a 17 percent wage disparity between documented and undocumented male Mexicans using the Survey of Income and Program Participation. This estimate is highly consistent with the conclusions of studies quantifying the wage effects of obtaining legal status. Two studies that focus on the 1986 IRCA amnesty estimate the wage penalty for being unauthorized to be around 20% ([Kossoudji and Cobb-Clark \(2002\)](#) and [Lozano and Sorensen \(2011\)](#)). [Lynch and Oakford \(2013\)](#) estimated that gaining legal status *and* citizenship would allow unauthorized immigrants to earn 25% more within five years. [Orrenius and Zavodny \(2015\)](#) provide additional evidence of the existence of a wage penalty associated with undocumented status. This study shows that the introduction of E-Verify, a program that allows employers to verify the legal status of employees, led to a reduction on the wages of undocumented workers. Only one study ([Lofstrom et al. \(2013\)](#)) found no evidence of improved employment outcomes following legalization, although this was only the case among the least-skilled immigrants.

Some recent studies have developed structural frameworks that are useful to analyze the effects of legalization (as well as the effects of deportation). [Edwards and Ortega \(2017\)](#) emphasize the importance of skill and productivity differences across documented and undocumented workers, and calibrate their model using detailed micro-data ([Center for Migration Studies \(2014\)](#)). [Machado \(2017\)](#) builds a related framework that emphasizes inter-generational aspects and allows for estimation of the fiscal effects of legalization. On a similar note, the empirical study by [Monras et al. \(2017\)](#) analyzes the 2004 amnesty in Spain, which legalized 0.6 million individuals. Their main finding is that legalization led to a net increase in tax revenue of about 4,000 euros per legalized individual. All these studies consider the whole undocumented population, without considering the educational choices of younger unauthorized individuals.

While the existence of documented-undocumented wage gaps has been clearly established, what is less understood is the nature of these gaps. Several authors have provided evidence of detrimental effects of illegality on the labor market opportunities and health of undocumented workers, which point to the existence of an *undocumented productivity penalty*. For example, illegal status has been shown to increase the risk of depression and anxiety among undocumented youth ([Abrego \(2011\)](#), [Gonzales \(2011\)](#), [Hainmueller et al. \(2017\)](#)). Other studies have shown how lack of legal work options confine educated undocumented youth into jobs that are not commensurate with their

skills (Gonzales (2011), Gleeson and Gonzales (2012), Cho (2017)). In addition, Hall and Greenman (2015) find that unauthorized workers are more likely to work in jobs that are physically strenuous and hazardous and receive no compensating differential for working in dangerous work environments.

Our study is also related to a series of recent empirical studies analyzing the effects of DACA on the labor market outcomes and college participation of DREAMers. Pope (2016) and Amuedo-Dorantes and Antman (2017) use data from the ACS and CPS, respectively. Both studies find positive effects of DACA on employment, but disagree on the effects on schooling. Amuedo-Dorantes and Antman (2017) find that DACA reduces college enrollment among probable DACA eligible students, whereas Pope (2016) fails to find evidence of an effect on schooling decisions. Hsin and Ortega (2017) use administrative data on students attending a large public university to estimate the effect of DACA on undocumented students' educational outcomes. Their data are unique because they accurately identify legal status. They find that DACA led to a large increase in dropout rates among undocumented college students enrolled at 4-year colleges (though not among those attending community college), providing additional confirmation for the findings in Amuedo-Dorantes and Antman (2017).

3 Data

3.1 Sources

Our data is based on the special extract of the American Community Survey (ACS) for the year 2012 provided by the Center for Migration Studies (2014). These data contain an individual-level measure of *imputed undocumented status* constructed on the basis of information on citizenship, year of arrival, country of origin, occupation, industry, and receipt of government benefits (Warren (2014)).⁵ Workers with certain occupations that require licensing, such as legal professions, police and firemen, and some medical professions, are assumed to be authorized, as well as individuals in government or in the military.⁶ The individual observations are then re-weighted using about 145 country-specific controls that yield independent totals for each state and for the total undocumented resident population.

⁵First developed by Passel and Clark (1998), the method has continued to evolve in Baker and Rytina (2013), Warren and Warren (2013), and Passel and Cohn (2015).

⁶Anecdotal evidence shows that there are some unauthorized workers in these industries, particularly in the military. Nevertheless the size of this group is negligible.

Existing estimates of the characteristics of the imputed unauthorized population obtained from the Census, the ACS and the CPS tend to be largely consistent with each other (Warren (2014), Borjas (2016), Pastor and Scoggins (2016)). Nevertheless, the broader validity of the imputation is still being analyzed. Assessments remain constrained by lack of large representative surveys that ask legal status.⁷

3.2 Sample definitions and summary statistics

We restrict to the population age 17-70 in the 2012 ACS. We distinguish between documented individuals, defined as those that were born in the United States or born abroad but deemed as likely authorized on the basis of the imputation, and likely unauthorized foreign-born individuals. Among the likely undocumented population we will concentrate on DREAMers, defined as individuals that arrived in the country before the age of 18 and have obtained a high school diploma (or similar).

We classify individuals as employed, in college, or doing neither of those activities. More specifically, we consider individuals as enrolled in college if they have a high school degree and report that are currently enrolled in school. An individual is considered employed if he stated so in the ACS survey. Last, we define individuals as *non-employed* if they are not employed and not enrolled in school. Table 1 provides a summary of the data. Column 1 shows that our data accounts for 232.4 million individuals (age 17-70). Among these, 61% were employed, 11% in college, and 28% doing neither of these two activities. Column 2 reports on the documented population, which amounts to 222 million individuals. Column 3 reports on 10.4 million (likely) undocumented individuals. Their employment rate is 68%, 7 percentage points higher than for the documented population, and their college enrollment rate is 6%, 5 percentage points lower than for the documented population. Column 4 restricts the sample to (likely) unauthorized individuals that arrived in the United States at age 17 or younger, which amounts to 2.93 million individuals. About 1.76 million of these are currently employed and the employment and college attendance rates are essentially the same as for the documented population. In column 5 we further restrict to the 1.65 million undocumented individuals with at least a high school diploma (or similar), which corresponds to our main population of interest. The data show an employment rate of 60% (or about 0.99 million employed individuals) and a college attendance rate of 22%. The

⁷The Survey of Income and Program Participation (SIPP), also a Census product, directly asks respondents about legal status but is roughly one sixth the size of the ACS. See Van Hook et al. (2015) for a comparison of results based on the SIPP and the ACS.

last column also imposes the condition of being 32 years old or younger in year 2012, which was required in order to qualify for DACA. In our data there are 1.42 million potentially DACA-eligible individuals. The table also reports the mean hourly wages of full-time workers for each column. On average documented workers earn close to \$21 while undocumented workers earn roughly 5 dollars less. Naturally, the bulk of the gap is explained by the lower average education and experience of undocumented workers, but not entirely.

It is also interesting to examine the relative size of these groups. In year 2012, undocumented individuals made up for 4.5% of the population, but almost 5% of employment. Undocumented individuals that arrived in the United States prior to age 18 accounted for about 1.25% of both the population and employment. When we further restrict to undocumented individuals that arrived as children and have a high school diploma (or similar), we find that this group accounts for 0.7% of the population and of employment. Because DREAMers are such a small fraction of the population, the effects of gaining legal status on overall GDP will necessarily be relatively small.

Importantly, our analysis will distinguish between workers by education and age, besides legal status. Specifically, we define 5 age groups: (1) 17-26, (2) 27-36, (3) 37-46, (4) 47-56, and (5) 57-70. We also define 4 groups on the basis of completed education (in year 2012): (1) high school dropouts, (2) individuals with a high school diploma or GED, (3) individuals with some college (i.e. at least one year of college or an associate's degree), and (4) individuals with a bachelor's degree (and possibly higher degrees as well). On the basis of our definition, there are no high-school dropout DREAMers.

We collapse the individual-level data (using the appropriate sample weights) by education, age, and documentation status. The results are summarized in [Table 2](#). The table reports the shares of the column totals. Columns 1-3 refer to the documented population, which can be broken down into 135 million employed individuals, 24 million attending college, and 63 million doing neither of those two activities. Note that by definition, individuals currently enrolled in college cannot be high school dropouts. Turning to DREAMers (columns 4-6), we find that 0.99, 0.37 and 0.29 million individuals were, respectively, employed, enrolled in college or doing neither of those two. We also note that under our definition there are no DREAMers in age groups 4 (age 47-56) and 5 (age 57-70).

4 Theoretical framework

Production takes place by means of a constant-returns Cobb-Douglas production function combining capital and labor. We assume that employers have access to a capital rental market at a fixed rental rate \bar{R} . As a result, the capital stock is proportional to labor, which results in a linear relationship between output and labor: $Y = BL$, where we will refer to B as total labor productivity. Below we describe the labor aggregate in detail. To close the model, we simply impose market clearing conditions on the output market and on all the skill-specific labor markets.

4.1 The labor aggregate

Let us now describe in detail the labor aggregate L . We allow workers to differ in education ($e = 1, \dots, E$), age ($a = 1, \dots, A$), and documentation status ($Doc, Undoc$). In total the number of labor types is given by $2 \times E \times A$. In our preferred specification we will focus on four education groups ($E = 4$) and five age groups ($A = 5$).

We aggregate all these types of workers by means of a multi-nested constant-elasticity of substitution (CES) aggregator, as in [Borjas \(2003\)](#), [Manacorda et al. \(2012\)](#) and [Ottaviano and Peri \(2012\)](#). To construct the labor aggregate we need data on the number of workers in each industry by education, age, and documentation status. We denote the vector of data by \mathbf{V} . In addition we need values for an array of worker productivity terms $\Theta = \{\theta\}$, one for each worker type, and elasticities of substitution across worker types $\Sigma = \{\sigma\}$. It is helpful to employ the following compact notation to make explicit the inputs needed to compute the labor aggregates $L(\mathbf{V}; \Theta, \Sigma)$.

Specifically, the labor aggregate is given by three levels of CES aggregation, with potentially different elasticities of substitution. To maximize comparability with previous studies, we choose the following nesting structure:

$$L = C(L_{e=1}, \dots, L_{e=E} | \theta_e, \sigma_e) \quad (1)$$

$$L_e = C(L_{e,a=1}, \dots, L_{e,a=A} | \theta_{e,a}, \sigma_a), \text{ for } e = 1, 2, \dots, E \quad (2)$$

$$L_{e,a} = \theta_{e,a}^{Doc} L_{e,a}^{Doc} + L_{e,a}^{Undoc}, \text{ for } e = 1, 2, \dots, E \text{ and } a = 1, s, \dots, A, \quad (3)$$

where the last equation assumes perfect substitution between documented and undocumented workers with the same education and age. The CES aggregator is defined

by

$$C(x_1, x_2, \dots, x_M | \theta, \sigma) = \left(\theta_1 x_1^{\sigma/(\sigma-1)} + \theta_2 x_2^{\sigma/(\sigma-1)} + \dots + \theta_M x_M^{\sigma/(\sigma-1)} \right)^{\frac{\sigma-1}{\sigma}}. \quad (4)$$

Implicitly, the last equation assumes that within an education-age group, documented and undocumented workers are perfect substitutes (as in [Borjas \(2003\)](#)), despite evidence to the contrary ([Manacorda et al. \(2012\)](#), [Ottaviano and Peri \(2012\)](#)). This choice is made to keep the framework as simple as possible and has virtually no effect on the estimated GDP effects (as shown in [Edwards and Ortega \(2017\)](#)). However, it will tend to exaggerate the effects of changes in the size and skill composition of the immigrant population on natives. Thus our analysis of wage effects should be interpreted as providing upper bounds for the effects on native wages.⁸

The documented-undocumented relative productivity parameters $\{\theta_{e,a}^{Doc}\}$ will play a crucial role in our analysis. In essence, when we simulate the effects of legalization we endow undocumented workers with the productivity of documented workers with the same age and level of education. Thus if these relative productivity parameters are larger than one, legalization will entail an increase in the labor aggregate $L_{e,a}$, as well as in the overall amount of labor L . The increase in labor will then trigger an investment response in the same direction in order to bring the capital-labor ratio and the marginal product of capital back to their initial level.

4.2 Exploitation of undocumented workers

There is plenty of evidence suggesting that the performance of undocumented workers in the labor market is diminished by their lack of legal status. Clear evidence of this is the over-qualification phenomenon ([Gonzales \(2011\)](#), [Gleeson and Gonzales \(2012\)](#), [Cho \(2017\)](#)), which is probably more widespread among undocumented workers than for immigrants in general. The typical example of over-qualification is when a highly educated immigrant, e.g. with a college degree, ends up employed in a low-skill occupation. These occupations are characterized by low productivity and, hence, pay low wages. Individuals in this situation will display very low wages given their education levels, which will translate into large documented-undocumented productivity gaps. More specific to the DREAMer population, there is also evidence that the threat of deportation

⁸On the contrary, the effects on the wages of legal immigrants will tend to be underestimated. We also note that we allow for different productivity (and therefore wage) levels between documented and undocumented workers within education-age cells in order to accommodate this important feature of the data.

creates anxiety and depression, which are likely to negatively affect the productivity of these workers (Abrego (2011), Gonzales (2011), Hainmueller et al. (2017)). Last, undocumented workers are probably subject to a substantial degree of mismatch in their workplaces, reflecting the fact that they cannot obtain a driver's license and are barred from many jobs because of E-Verify or licensing requirements. As a result, they often end up in jobs that are a poor match for their skills, which results in a very low return to their levels of experience and education.

It is also possible that documented-undocumented wage gaps reflect other factors besides productivity gaps. Some studies (Hotchkiss and Quispe-Agnoli (2009), Brown et al. (2013) and Hirsch and Jahn (2015)) suggest that undocumented workers are often not paid their full marginal product. Clearly, their bargaining power is diminished by their lack of legal status, and employers can appropriate a larger part of the surplus generated by the employer-employee match. If exploitation of this type is present and we ignore it, observed wages will *underestimate* the productivity of undocumented workers relative to legal immigrants and natives with the same education and experience. This will result in upwardly biased productivity gaps between documented and undocumented immigrant workers, and will lead to upwardly biased estimates of the gains from legalization.

In order to allow documented-undocumented relative wages to reflect both productivity differences and exploitation, we assume that unauthorized workers are 'taxed' at a rate $\tau_{e,a}$ by employers.⁹ The net income of undocumented workers in education age group (e, a) is then given by

$$w_{e,a}^{Undoc} = (1 - \tau_{e,a})MPL_{e,a}^{Undoc}, \quad (5)$$

where MPL stands for the marginal product of labor of that education-age group.

Because of perfect substitution between documented and undocumented immigrants, their relative wage (within an education-experience cell) will be given by

$$\frac{w_{e,a}^{Doc}}{w_{e,a}^{Undoc}} = \frac{\theta_{e,a}^{Doc}}{1 - \tau_{e,a}}. \quad (6)$$

As we shall see below, the data show substantial wage gaps between documented and undocumented workers in the same education-age category. Because the degree of exploitation is not known, we will need to make an identifying assumption in order to back out the relative productivity terms from the data on relative wages. In our main

⁹For consistency with the rest of the model, we assume that the proceeds of this tax are distributed in a lump-sum manner to all documented workers.

specification we will choose the more standard approach of ignoring exploitation and assume that relative productivity equals relative wages, but we will also analyze the alternative scenario where there are no productivity differences between documented and undocumented workers with the same observable skills, $\{\theta_{e,a}^{Doc} = 1\}$, and all wage gaps are explained on the basis of exploitation taxes $\{\tau_{e,a}\}$.

5 Calibration

We need to assign values to the parameters of the model: $\{B, \Theta, \Sigma, \tau\}$. In our calibration we will consider $E = 4$ levels of education and $A = 5$ age groups. We first consider the following values for the elasticities of substitution. Because workers are increasingly more similar in terms of observable skills as we move up the CES layers, it makes sense to consider elasticities of substitution that (weakly) increase as we move from level 1 to level 2: $\sigma_e \leq \sigma_a$. We adopt fairly standard values for these elasticities: $(\sigma_e, \sigma_a) = (3, 6)$. These values are fairly uncontroversial (Card and Lemieux (2001), Goldin and Katz (2008)).

Next, we turn to the calibration of the productivities by type of labor. For now we take the stance that documented-undocumented wage gaps (within education-age groups) are the reflection of productivity differences. As discussed earlier, it is well established empirically that lack of legal status negatively affects labor market opportunities and health, with detrimental effects on worker productivity. We follow a sequential process to calibrate productivity terms Θ and to compute the CES aggregates at each level. The process relies crucially on data on relative wages and employment. We use average hourly wages for full-time workers as our measure of income, but measure employment including workers regardless of their usual hours worked.

We begin with level 3, which aggregates documented and undocumented workers in the same age and completed education groups. Under the assumption of no exploitation ($\tau_{e,a} = 0$ for all e, a), Equation (6) becomes

$$\frac{w_{e,a}^{Doc}}{w_{e,a}^{Undoc}} = \frac{\theta_{e,a}^{Doc}}{\theta_{e,a}^{Undoc}}. \quad (7)$$

Thus, documented-undocumented relative wages identify the relative productivity terms. After normalizing $\theta_{e,a}^{Doc} = 1$ for all (e, a) , it is then straightforward to compute, for each cell (e, a) , the CES labor aggregate $L_{e,a}$.

Next, we turn to level 2. For each education level e , given the value of σ_a and data on wages and the values for $L_{e,a}$ computed in the previous step, we can easily obtain $\theta_{e,a}$ from

$$\frac{w_{e,a}}{w_{e,1}} = \left(\frac{\theta_{e,a}}{1} \right) \left(\frac{L_{e,a}}{L_{e,1}} \right)^{-1/\sigma_a}, \text{ for } a = 2, \dots, A, \quad (8)$$

where we have normalized $\theta_{e,1} = 1$. Next, we compute aggregate L_e for each e using

$$L_e = C(L_{e,1}, \dots, L_{e,A} | \theta_{e,a}, \sigma_a), \text{ for } a = 2, \dots, A.^{10} \quad (9)$$

Finally, level 1 relates the relative wages between the two education groups. For each cell e , we obtain $\theta_e = (1, \theta_2, \theta_3, \theta_4)$ from

$$\frac{w_e}{w_1} = \left(\frac{\theta_e}{1} \right) \left(\frac{L_e}{L_1} \right)^{-1/\sigma_e}, \quad (10)$$

and compute L using

$$L = C(L_1, \dots, L_4 | \theta_e, \sigma_e). \quad (11)$$

At this point it is helpful to examine the values that we obtain for these parameters, which are collected in [Table 3](#). Column 1 reports the values for the relative productivity terms (under the assumption of no exploitation). The weighted average of the column is 1.22, indicating that documented workers earn about 22% more than undocumented workers with the same observable skills. Under our assumption of no exploitation, this translates into a sizable productivity gap. We also note that there is a great deal of heterogeneity in the size of the undocumented productivity penalty across skill groups. Consider, for instance, age group 2 (27-36 year-olds). The documented-undocumented relative productivity terms for this age group are 1.18, 1.26, 1.34 and 1, for education levels 1 (high school dropouts), 2 (high school graduates), 3 (an associate's degree or some college), and 4 (college graduates or higher), respectively. These figures show that the highest gaps are for workers with a high school degree and some college education, and the gap is non-existing for college graduates.

Last, we calibrate the term for total aggregate productivity to match GDP in year 2012 by setting $B^{LR} = GDP/L$.

¹⁰ $\theta_{e,a}$ denotes the vector of relative productivity terms across experience groups with education e .

6 The effects of temporary legal status: DACA

Deferred Action for Childhood Arrivals (DACA) was launched by President Obama in June 2012. Our baseline data is for year 2012, which can be considered the latest pre-DACA period.¹¹ Thus, we can interpret our baseline values for the wages of DREAMers as reflecting their wages while working lacking legal status. On the basis of the key eligibility requirements for DACA, our population of interest are likely undocumented individuals that arrived in the United States prior to their 16th birthday, were younger than 32 years old in 2012, and had a high school diploma (or GED) in that year.¹² According to our data, this population contains 1.4 million individuals, which is fairly close to the 1.3 million estimated by the Migration Policy Institute (2016).¹³

6.1 The DACA counterfactual

As of June 2017, slightly less than 800,000 individuals have been granted DACA permits. This amounts to a take-up rate slightly above 0.5. In order to take this into account, we denote by ϕ the DACA take-up rate. Lacking evidence against it, for now we assume that the take-up rate is the same across education and age groups within the DREAMer population.

Based on the existing empirical evidence, it appears that DACA had two effects. First, DACA recipients were given work permits presumably allowing them to access the labor market under the same conditions as documented workers. In the model, we will assume that DACA recipients become indistinguishable from documented workers with the same age and education in terms of productivity. Because DREAMers graduated from a U.S. high school, this assumption seems highly plausible. Quantitatively, the key terms in determining the resulting productivity boost are the relative documented-undocumented productivity terms, $\theta_{e,a}^{Doc}$. Second, there is evidence that DACA triggered a participation effect that led to an increase in employment. According to Pope (2016) the additional workers transitioned from unemployment and according to Amuedo-Dorantes and Antman (2017) and Hsin and Ortega (2017), they dropped out of college in order to work. This participation effect will magnify the effect of DACA on GDP beyond the productivity boost.

¹¹Even though DACA was rolled out in 2012, the number of work permits issued was very low until 2013. Only 1,684 applications were approved by the end of 2012 according to the USCIS.

¹²There were a number of additional eligibility requirements that cannot be measured using our data, such as having a clean criminal record.

¹³See <https://www.migrationpolicy.org/programs/data-hub/deferred-action-childhood-arrivals-daca-profiles>.

To introduce the participation effect into our model, let δ_c be the fraction of DACA recipients that were in college and decided to drop out of school in order to work.¹⁴ Thus the number of college students that receive DACA and dropped out before graduation to join the workforce is given by $\delta_c(\sum_e \sum_a \phi C_{e,a}^{Dream})$, where $C_{e,a}^{Dream} \leq C_{e,a}^{Undoc}$ is the number of undocumented individuals of age a and education e that are enrolled in college and arrived in the country as children.¹⁵ Likewise, we let δ_N be the fraction of DACA recipients that were initially non-employed and started working when they received a DACA permit. This results in an increase in employment equal to $\delta_N(\sum_a \sum_e \phi N_{e,a}^{Dream})$.

We denote the baseline population in the 2012 data by:

$$\mathbf{V} = \{L_{e,a}^{Doc}, C_{e,a}^{Doc}, N_{e,a}^{Doc}, L_{e,a}^{Undoc}, C_{e,a}^{Undoc}, N_{e,a}^{Undoc}\}.$$

The counterfactual undocumented population under DACA is therefore: for each (e, a) ,

$$\begin{aligned}\hat{L}_{e,a}^{Undoc} &= L_{e,a}^{Undoc} - \phi L_{e,a}^{Dream} \\ \hat{C}_{e,a}^{Undoc} &= C_{e,a}^{Undoc} - \phi C_{e,a}^{Dream} \\ \hat{N}_{e,a}^{Undoc} &= N_{e,a}^{Undoc} - \phi N_{e,a}^{Dream}.\end{aligned}$$

Turning now to the documented population, for each (e, a) ,

$$\begin{aligned}\hat{L}_{e,a}^{Doc} &= L_{e,a}^{Doc} + \phi (L_{e,a}^{Dream} + \delta_c C_{e,a}^{Dream} + \delta_n N_{e,a}^{Dream}) \\ \hat{C}_{e,a}^{Doc} &= C_{e,a}^{Doc} + \phi(1 - \delta_c) C_{e,a}^{Dream} \\ \hat{N}_{e,a}^{Doc} &= N_{e,a}^{Doc} + \phi(1 - \delta_n) N_{e,a}^{Dream}.\end{aligned}$$

Note that the overall population is the same in the counterfactual and baseline scenarios. However, there may be an increase in the overall amount of *labor* because of the differential productivity between documented and undocumented workers. A bit of algebra delivers the key expression summarizing the effects of DACA on the labor aggregates: for each (e, a) , the increase in labor is given by

$$\hat{L}_{e,a} - L_{e,a} = (\theta_{e,a}^{Doc} - 1) \phi + \theta_{e,a}^{Doc} \phi (\delta_c C_{e,a}^{Dream} + \delta_n N_{e,a}^{Dream}). \quad (12)$$

¹⁴Note that δ_c is *not* the fraction of DREAMers in college, but only the fraction of that group that decided to drop out of college upon receiving temporary legalization.

¹⁵ $C_{e,a}^{Undoc}$ refers to all undocumented individuals enrolled in college (with the corresponding education and age), and $C_{e,a}^{Dream}$ refers only to those that arrived as children.

The first term is the productivity boost associated with legalization. The second term is the participation boost because of DREAMers that were initially in college or non-employed and decided to seek employment because of DACA. Aggregation over age and education groups will deliver the overall increase in L . Clearly, the documented-undocumented relative productivity terms, $\{\theta_{e,a}^{Doc}\}$, will play a key role in determining the economic effects of DACA. To the extent that these coefficients are larger than one, temporary legalization through DACA will lead to a net increase in the overall amount of labor. Moreover, because of the linear relationship between labor and output, the percent change in labor will translate into an equal percent change in output. Thus

$$G = \left(\frac{\tilde{Y}}{Y_0} \right) = \left(\frac{\tilde{L}_1}{L_0} \right), \quad (13)$$

and we shall calculate dollar amounts for the effect of DACA on GDP using

$$\tilde{Y} - Y_0 = \left(\frac{\tilde{Y}}{Y_0} - 1 \right) Y_0 = (G - 1) Y_0. \quad (14)$$

6.2 Parameters regarding the effects of DACA

Parameter ϕ stands for the DACA take-up rate. According to USCIS, between its inception in 2012 and 2017 (September 30), 798,980 individuals received protection through DACA. We will set ϕ equal to the ratio between the actual number of DACA applications approved (not counting renewals) and the number of DACA eligible individuals according to our dataset (1.42 million as shown in the last column of [Table 1](#)). This results in a value of $\phi = 0.56$.

Parameter δ^C is the probability that a DACA recipient who was in college decides to drop out and join the labor market. [Hsin and Ortega \(2017\)](#) estimate that the college dropout rates for DREAMers in college increased by 4 percentage points when DACA was implemented (reaching 7 percentage points in senior colleges). Their data does not identify DACA recipients and therefore they interpret their estimate as an intent-to-treat effect. Therefore their estimates corresponds more closely to $\phi\delta^C = 0.04$. Given the value for ϕ , we therefore pick $\delta^C = 0.07$. Using CPS data, [Amuedo-Dorantes and Antman \(2017\)](#) also found evidence that DACA reduced college attendance among DACA-eligible college students. Their estimates are somewhat larger than those of [Hsin and Ortega \(2017\)](#), but their identification of unauthorized individuals in the data is less

accurate, so we base our calibration on the more conservative estimates.

Parameter δ_N is the probability that a DACA recipient who was non-employed, defined as not working and not enrolled in college, successfully seeks employment. According to Pope (2016), DACA increased the probability of employment for DACA-eligible individuals by 4 to 5 percentage points. His estimates suggest that the increase in employment was fueled by an increase in labor force participation and a decrease in unemployment. As before, a conservative interpretation of his estimates implies that $\phi\delta^N = 0.04$ and therefore the probability that an actual DACA recipient who was previously non-employed obtains employment is around $\delta^N = 0.07$. However, it is important to keep in mind that we need to avoid duplicating the increase in employment triggered by DACA (by maintaining $\delta^N + \delta^C = 0.07$). The studies above largely agree on the increase in employment generated by DACA, but disagree on whether the newly employed individuals originated from college or from non-employment. Thus we will consider the two scenarios separately. The top panel of Table 4 summarizes the DACA-specific parameters.

6.3 Results

As explained above, our calibrated model matches several relevant moments about the U.S. economy in year 2012. Specifically, we match overall GDP and the structure of wages and employment in terms of education, age and documentation status. Now we turn to the results of our simulation. In terms of outcomes, we first quantify the effects of DACA on GDP and later turn to the effects on the wage structure, emphasizing the effects on the wages of the individuals gaining temporary legalization through the DACA program.

6.3.1 Effects of DACA on GDP

It is helpful to consider first the productivity effect, which is the first part of the expression in Equation (12). At the education-age level, this term only depends on the take-up rate in the program (ϕ) and the documented-undocumented relative productivity term ($\theta_{e,a}^{Doc}$). To isolate this effect we shut down the participation channels ($\delta_c = \delta_N = 0$) when simulating the scenario where DACA permits are distributed in the numbers observed in the data. The results are presented in the first column of Table 5. In this first scenario, the increase in GDP due to DACA amounts to 0.0144%, which amounts to a \$2.8 billion

annually, or \$6,217 per DACA recipient in the workforce.¹⁶ While this figure is small relative to the U.S. GDP, it is important to keep in mind that DACA recipients are only about 0.3% of the U.S. population.

Scenario 2 is our preferred scenario. In this case we allow for a participation effect driven by DREAMers that were initially enrolled in college but decided to drop out in order to work when they received DACA, where the intensity of this effect is based on the estimates by [Amuedo-Dorantes and Antman \(2017\)](#) and [Hsin and Ortega \(2017\)](#). In this case the effect is about 25% higher than in scenario 1, amounting to a 0.0178% increase in GDP corresponding to \$3.5 billion in the aggregate and \$7,454 per employed DACA recipient. In scenario 3 we consider the alternative participation effect based on the estimates by [Pope \(2016\)](#), where the inflow of DREAMers into employment originates in individuals that were previously non-employed. The results imply a slightly smaller GDP gain than in scenario 2, with a GDP increase of 0.0170%, amounting to \$7,181 per employed DACA recipient. It is also worth noting that this increase in GDP is solely due to the effects of legalization. A full assessment of the economic contribution of undocumented workers to the economy needs to take into account the value added of these workers prior to receiving DACA (as in [Edwards and Ortega \(2017\)](#)). We will return to this point in the next section.

Scenario 4 estimates the potential gains from DACA, in the case that all 1.42 million eligible individuals received protection under the program. In this case the GDP increase could have reached almost 0.03% of GDP. Last, scenario 5 considers an alternative calibration where we assume that the wage gaps between similarly skilled documented and undocumented workers are exclusively due to exploitation. In this case, the calibration entails $\theta_{e,a}^{Doc} = 1$ and we are effectively turning off the productivity effect and are left exclusively with the participation effect. In this case (scenario 5), DACA would have led to a meager 0.0032% increase in GDP. Clearly, the assumption of full exploitation as an explanation of the relative wage gaps between documented and undocumented workers is very extreme, given the extensive empirical evidence in support of the detrimental productivity effects of undocumented status.¹⁷

¹⁶Keep in mind that some DACA recipients are in college or non-employed.

¹⁷If we had accurate estimates of the degree of exploitation we would be able to separately calibrate the exploitation tax and the relative productivity terms. However, the existing empirical literature does not offer an estimate of the extent of exploitation for undocumented workers.

6.3.2 Wage effects of DACA

We now turn to the wage effects of DACA. Before discussing the details, it is important to keep in mind that DACA beneficiaries are a very small share of the U.S. population and, as a result, their impact on the wages of natives is bound to be very small. Naturally, the effect on the wages of the DREAMers obtaining legal status will be much larger.

The wage effects of our simulation are reported in [Table 6](#). We begin with column 1, which reports the percent change in wages relative to baseline for workers that did not change documentation status, that is, for documented workers or undocumented workers that did not receive DACA permits. Because we assumed that documented and undocumented workers with the same observable skills are perfect substitutes, these two groups experience the same percent change in their wages. Column 1 shows that the wage effects of DACA are negligible. To a large extent this is due because the change in the relative skill supplies of DACA is very small given the small size of the group of DACA recipients relative to overall employment. The largest effects entail a 0.04% reduction in the wages of high school graduates (age group 2) and a 0.02 percent reduction in the wages of workers with some college (age groups 1 and 2). Column 3 aggregates these figures by education group, weighting each age-education group by their age shares by education (from column 2). The resulting figures show 0.01% drops in the wages of high-school graduates and individuals with some college, and practically zero effects on the wages of workers at the top and bottom of the education distribution.

Column 4 reports the percent changes in the wages of the DACA recipients, which on the basis of the eligibility criteria consisted only of DREAMers with at least a high school diploma in age groups 1 and 2. These individuals experienced a substantial productivity increase. The figures in the table show sizable increases for all age-education groups containing legalized individuals, reaching up to 31%. However, there is a great deal of heterogeneity in the size of the wage growth across education-age groups of legalized individuals. The largest increases pertain to individuals in age group 2 (27-36 year olds) with a high school degree or some college. Column 6 provides the corresponding age-weighted averages by education level. The average DACA recipient with a high school degree experienced a 12.43% increase in wages. Likewise, individuals with some college experienced average wage increases of 11.73%. In contrast, we do not find evidence of significant wage growth for the average DACA recipient with a college degree. The reason is that the documented-undocumented relative productivity for this group turned out to be essentially 1 in our calibration (see [Table 3](#)). Thus legalization did not improve

their labor market outcomes.

7 The effects of permanent legalization

7.1 The DREAM Act counterfactual

According to the 2017 Senate version of the DREAM Act, obtaining permanent residence is a two-stage process.¹⁸ The first stage provides eligible individuals with *conditional status*, that is, reprieve from deportation and a work permit. The key requirements for conditional status that can be measured using our data are: (i) having arrived in the country at age 17 or younger and (ii) having graduated from high school or obtained a GED.¹⁹ The second stage of the process imposes additional requirements in order to obtain legal permanent residence. Eligible individuals must satisfy one of the following criteria by the end of the conditional status period (besides maintaining a clean criminal record): (i) obtaining an associate's degree or at least 2 years of college education toward a bachelor's degree; (ii) 2 years of military service; (iii) or 3 years of continuous employment.

On the basis of the 2014 ACS, the Migration Policy Institute estimates that 1.8 million individuals are eligible for conditional status in year 2017, out of an overall 3.3 million individuals that arrived in the country illegally as children. In comparison, our estimates based on the 2012 ACS for these figures are 1.4 million – undocumented that arrived by the age of 17 and currently hold a high school diploma – and 2.9 million, respectively (Table 1). Our main estimates of the economic effects of the DREAM Act will be based on the 1.4 million individuals already eligible for conditional status.

Individuals that obtain *conditional status* will benefit from relief from deportation and a work permit, much like was the case for DACA recipients. In terms of the model we will simply consider them as having the same productivity as documented workers with the same age and education. This is exactly the productivity boost considered earlier, potentially differing only in the take-up rate ψ . Unlike in the case of DACA, we believe that the take-up rate for the DREAM Act will be practically universal among eligible individuals since there is no fear from deportation ($\psi = 1$). We also believe that, unlike DACA, conditional status is unlikely to induce DREAMer college students to drop out. The reason is that their planning horizon remains unchanged and the returns

¹⁸The current version of the House bill has similar requirements, though a little more restrictive.

¹⁹Like for DACA, a clean criminal record is also a requirement to obtain conditional status.

to a college degree will increase thanks to the permanent legal status.

In fact, the requirements to obtain permanent residence in the DREAM Act will likely generate dynamic participation effects. As noted earlier, one of the routes to satisfy the permanent-residence requirement in the second stage is to obtain at least two years of college education. This will raise college attendance among individuals in conditional status, relative to what we would have observed otherwise. Thus, unlike DACA, we may see a *negative* labor market participation effect in the short run when some employed DREAMers quit their jobs to enroll in college. In the long run, these workers will come back to the workforce with some college education and enhanced productivity, which will imply a *positive* participation effect. We believe that this *educational boost* will take place primarily among DREAMers with a high school degree, who are the most likely population to choose the college education route in order to fulfill the permanent residence requirement.

7.2 Short-run participation effects

More specifically, we define γ_e^L and γ_e^N to be, respectively, the *increase* in the probability of college enrollment for working and non-employed DREAMers, respectively. Lacking empirical estimates of the size of these effects, we shall assume that these probabilities are zero for individuals with less than a high school education or already having some college education: $\gamma_e^L = \gamma_e^N = 0$ for $e \neq 2$. The reason is that it is much more likely that these individuals will choose to fulfill the permanent residence requirement by joining the Army or being continuously employed for the required number of years. However, many DREAMers with a high-school diploma are likely to choose to attend college in order to fulfill the additional requirement. Thus we will set $\gamma_2^L \geq 0$ and $\gamma_2^N \geq 0$ in our calibration.

As a result, the short-run counterfactual undocumented population under the DREAM Act is as follows. For each (e, a) , a fraction ψ of all DREAMers (undocumented that arrived in the country as children) receives conditional status:

$$\begin{aligned}\tilde{L}_{e,a}^{Undoc} &= L_{e,a}^{Undoc} - \psi L_{e,a}^{Dream} \\ \tilde{C}_{e,a}^{Undoc} &= C_{e,a}^{Undoc} - \psi C_{e,a}^{Dream} \\ \tilde{N}_{e,a}^{Undoc} &= N_{e,a}^{Undoc} - \psi N_{e,a}^{Dream}.\end{aligned}$$

Turning now to the documented population, a fraction γ_e^L of the Dreamers in the

workforce with education level e that received conditional status ($\psi L_{e,a}^{Dream}$) will quit their jobs in order to enroll in college. Likewise, a fraction γ_e^N of the non-employment Dreamers with education level e that received conditional status ($\psi N_{e,a}^{Dream}$) will enroll in college. More specifically, for each (e, a) ,

$$\begin{aligned}\tilde{L}_{e,a}^{Doc} &= L_{e,a}^{Doc} + \psi(1 - \gamma_e^L)L_{e,a}^{Dream} \\ \tilde{C}_{e,a}^{Doc} &= C_{e,a}^{Doc} + \psi(C_{e,a}^{Dream} + \gamma_e^L L_{e,a}^{Dream} + \gamma_e^N N_{e,a}^{Dream}) \\ \tilde{N}_{e,a}^{Doc} &= N_{e,a}^{Doc} + \psi(1 - \gamma_e^N)N_{e,a}^{Dream}.\end{aligned}$$

In our calibration we shall set $\gamma_2^L = \gamma_2^N = \gamma$ for simplicity. We believe that a plausible value for this parameter is $\gamma = 1/2$, that is, one in two DREAMers with a high school degree will choose to obtain some college education in order to qualify for permanent residence. However, we will also produce estimates for higher and lower values of this parameter. Table 4 gathers the key parameter values in the simulation of the effects of the DREAM Act.

7.3 Long-run participation effects

The DREAMers that were initially in the workforce or non-employed in the baseline data but decide to attend college because of the eligibility requirements, $\psi\gamma(L_{2,a}^{Dream} + N_{2,a}^{Dream})$, are now graduating from college with their enhanced skills. We make two conservative assumptions. First, we assume that the DREAMers that went back to school obtain only the *minimum* college education required to satisfy the permanent residence requirement. Namely, those individuals transition from education group 2 (high school graduate) to education group 3 (some college or an associate's degree). Second, we assume that individuals that were initially non-employed stay in that state despite their increased educational attainment.²⁰ Thus, the size of the workforce is unchanged relative to the baseline.

The long-run undocumented population under the DREAM Act is the same as it

²⁰This assumption is probably overly conservative but we are unsure what fraction of these newly minted graduates would ultimately enter the workforce. If all the DREAMers that transition from education level 2 to education level 3 were to become employed, the number of documented individuals with education level 3 in the long-run DREAM Act scenario ($\tilde{L}_{3,a}^{Doc}$) would have to be increased by $\psi\gamma N_{2,a}^{Dream}$. Accordingly, $\tilde{N}_{3,a}^{Doc}$ would have to be decreased by the same amount. Clearly, this would have an additional positive effect on GDP growth.

was in the short-run scenario. For each (e, a) ,

$$\begin{aligned}\tilde{L}_{e,a}^{Undoc} &= L_{e,a}^{Undoc} - \psi L_{e,a}^{Dream} \\ \tilde{C}_{e,a}^{Undoc} &= C_{e,a}^{Undoc} - \psi C_{e,a}^{Dream} \\ \tilde{N}_{e,a}^{Undoc} &= N_{e,a}^{Undoc} - \psi N_{e,a}^{Dream}.\end{aligned}$$

Turning now to the documented population, for each (e, a) , the workforce will be given by

$$\begin{aligned}\tilde{L}_{e,a}^{Doc} &= L_{1,a}^{Doc} + \psi L_{1,a}^{Dream}, \text{ for } e = 1 \\ &= L_{2,a}^{Doc} + \psi(1 - \gamma_2^L) L_{2,a}^{Dream}, \text{ for } e = 2 \\ &= L_{3,a}^{Doc} + \psi(L_{3,a}^{Dream} + \gamma_2^L L_{2,a}^{Dream}), \text{ for } e = 3 \\ &= L_{4,a}^{Doc} + \psi L_{4,a}^{Dream}, \text{ for } e = 4,\end{aligned}$$

where the group with some college ($e = 3$) includes the high school graduates that attended college to fulfill the permanent residence requirement. Importantly, these equations assume that initially non-employed DREAMers that decided to obtain some college education to qualify for permanent residence remain non-employed in the long-run counterfactual.

As for the non-employed and the college-enrolled population,

$$\begin{aligned}\tilde{N}_{e,a}^{Doc} &= N_{e,a}^{Doc} + \psi N_{e,a}^{Dream} \\ \tilde{C}_{e,a}^{Doc} &= C_{e,a}^{Doc} + \psi C_{e,a}^{Dream}, \text{ for all } e \text{ and } a.\end{aligned}$$

7.4 Results

7.4.1 Effects of the DREAM Act on GDP

Our estimates for the long-run effects on GDP from passing the DREAM Act are reported in [Table 7](#). We consider a variety of scenarios that differ in the value of the parameter governing the share of DREAMers with a high school degree that choose to attend college in order to obtain permanent residence ($\gamma_2^L = \gamma_2^N = \gamma$).

The top panel in the table (scenarios 1-3) presents the results corresponding exactly to the long-run effects on GDP according to the set of equations (15). It is helpful to

begin by considering scenario 1, where college enrollment is unaffected by the DREAM Act ($\gamma = 0$). In this case we find that GDP will increase by 0.05%, which amounts to an overall increase of \$9 billion per year. To provide a more intuitive measure of the size of the effects, it helps to consider that 1.65 million individuals benefit from legalization in our calculations and, out of those, 0.99 million are working in the long-run counterfactual. On the basis of the latter figure, the average long-run increase in GDP per legalized worker results in \$9,104. Because there are no participation effects in this scenario, the short-run change in GDP coincides exactly with the short-run value.

Let us now take into account the increased incentives to attend college (scenario 2). Specifically, we assume $\gamma = 1/2$, that is, we assume that 1 in 2 high-school graduates with conditional status choose to obtain an associate's degree (or two some years of schooling toward a bachelor's degree). In the short run, there will be two opposing effects on GDP. On the one hand, there is a productivity boost associated with obtaining conditional legal status, as was the case with DACA. However, this positive effect is practically neutralized by a sizable *negative* participation effect driven by the high school graduate DREAMers that leave the workforce to enroll in college. As a result, GDP is practically unaffected in the short run.²¹ However, over time a sizable positive effect on income would emerge. The long-run effect on GDP reflects a sizable *positive participation effect*: the individuals that left for college (and were initially employed) return to the labor market with enhanced productivity. This leads to a 0.08% increase in GDP (or \$15.2 billion per year), which amounts to \$15,371 per employed legalized individual. Last, scenario 3 considers a more extreme participation effect, where all DREAMers with a high school degree choose to obtain some college education ($\gamma = 1$). In this case GDP would increase by 0.11%.

In sum, our analysis implies that passing the DREAM Act will increase the economic contribution of DREAMers that obtain legal status. We estimate that GDP will increase by an average of 9 to 21 thousand dollars for each worker obtaining legal status. This amount would add to the economic contribution of DREAMers prior to legalization, which can be quantified by comparing GDP in the baseline scenario (prior to legalization) to the level of GDP in a counterfactual where DREAMers are removed from the economy.

²¹Even though not reported in [Table 7](#), we can also calculate the short-run effects of legalization on GDP. These effects can be negative for high values of γ , reflecting the reduction in the workforce when DREAMers with a high-school degree choose to quit their jobs in order to enroll in college. However, this finding could easily be overturned if individuals can simultaneously work and attend college. In fact, this seems to be the case for a large share of immigrant students attending community colleges ([Hsin and Ortega \(2017\)](#)).

As reported in the bottom row of [Table 7](#), removal of DREAMers from the workforce would entail a 0.42% reduction in GDP, amounting to \$46,061 per worker. As a result, passing the DREAM Act would increase the *overall* contribution of DREAMers to GDP to be around \$60,000 per worker.

7.4.2 Effects of the DREAM Act on wages

Our estimates for the long-run effects on wages are collected in [Table 8](#). Columns 1-3 refer to wage effects pertaining to individuals that did not experience a change in status, that is, documented individuals (who stayed documented) and undocumented individuals that did not benefit from legalization.²² Column 1 reports the wage effects for this population by education-age groups. As expected, the wages of individuals with education level 3 (some college) fall whereas there is an increase in the wages of individuals in all other education-age groups. However, it is important to note that the magnitudes of the wage effects are very small. Column 3 reports the percent average wages by education level (using the weights reported in column 2). Workers with some college would see their wages fall by 0.22 percent on average, and workers with a high school degree would experience a 0.16 percent increase. At the same time the wages of individuals at the top and bottom of the education distribution would remain practically unaffected.

Next, we turn to the individuals who obtain legal status (columns 4-6).²³ Naturally, the wages of these workers will experience much larger changes. However, we find a great deal of heterogeneity in the size of the wage effects. On the basis of the results in column 6, college graduates that obtain legal status will experience a meager 0.67% average increase in their wages. The reason for this small increase can be traced back to the calibration for the documented-undocumented productivity gap, which was basically non-existing. In contrast, individuals with some college education that obtain legal status will see their wages increase by an average of 15.33% thanks to the elimination of a substantial undocumented productivity penalty. Yet, our estimates suggest that the largest average wage increase would correspond to high-school graduate DREAMers obtaining legalization, with a 52% increase. The reason is that the average individual in this group benefits both from the increase in productivity associated with legal status

²²Recall that because of the assumption of perfect substitution in production among workers with the same education and age, the percent change in the wages of groups that did not change documentation status but share the same skills will be identical.

²³Under our assumptions, only DREAMers with a high school degree are eligible under the DREAM Act.

and from rewards to the increased educational attainment.

8 Conclusions

This paper has developed a simple general equilibrium model that can be used to quantify the economic gains from legalizing undocumented workers that arrived in the United States as children. Our model extends the framework proposed by [Edwards and Ortega \(2017\)](#) by considering a variety of participation and education effects. We use the model to simulate the effects of temporary legalization as implemented through the DACA program, as well as the effects of offering a track to permanent residence through the 2017 Senate version of the DREAM Act.

At some level both modes of legalization share the feature that they are likely to increase the productivity of workers who obtain legal status because of the improved labor market opportunities. However, there are important differences between the two modes of legalization, stemming from participation effects of different sign and magnitude. DACA entails a positive participation effect, driven by the many undocumented college students that dropped out in order to take advantage of the improved labor market opportunities. While this effect increases the short-run effect of DACA on GDP, it may entail a cost in the long run given that it is unlikely that these individuals return to college in the future.

In comparison the DREAM Act entails a *negative* participation effect in the short run because it is likely to induce some undocumented high-school graduates that were initially employed to quit their jobs and enroll in college in order to obtain permanent residence.²⁴ In contrast, the long-run effect on GDP can be rather large when the new college graduates return to the workforce. We estimate that the long-run increase in GDP will range between 0.05% and 0.11%.

We have also analyzed the wage effects of legalization under DACA and the DREAM Act. Because DREAMers are only a small fraction of the population, legalization has very small effects on the wages of natives workers. In contrast, the wages of most individuals gaining legal status will increase substantially, with the largest increases being experienced by DREAMers that increase their educational attainment in order to qualify for legalization.

We close by noting that the GDP effects of the DREAM Act could be substantially

²⁴Under some parameter values this effect is large enough that it may overshadow the productivity gains associated with legal status.

larger than the estimates presented here. The reason is that we have limited our analysis to DREAMers that have completed high school. However, one would expect that passing the DREAM Act is likely to encourage many DREAMers that had not completed high school to go back to school in order to become eligible for legalization. Our framework could be extended in order to incorporate this additional educational response to the eligibility requirements of the DREAM Act.

References

- Abrego, Leisy J, “Legal consciousness of undocumented Latinos: Fear and stigma as barriers to claims-making for first-and 1.5-generation immigrants,” *Law & Society Review*, 2011, 45 (2), 337–370.
- Amuedo-Dorantes, Catalina and Francisca Antman, “Schooling and labor market effects of temporary authorization: evidence from DACA,” *Journal of Population Economics*, January 2017, 30 (1), 339–373.
- Baker, Bryan C. and Nancy Rytina, “Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012,” 2013. Washington, DC: Office of Immigration Statistics, Policy Directorate, US Department of Homeland Security. http://www.dhs.gov/sites/default/files/publications/ois_ill_pe_2012_2.pdf.
- Borjas, George, “The Labor Demand Curve is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market,” *Quarterly Journal of Economics*, November 2003, 118 (4), 1335–1375.
- Borjas, George J., “The Labor Supply of Undocumented Immigrants,” NBER Working Papers 22102, National Bureau of Economic Research, Inc March 2016.
- Brown, J. David, Julie L. Hotchkiss, and Myriam Quispe-Agnoli, “Does employing undocumented workers give firms a competitive advantage?,” *Journal of Regional Science*, 2013, 53 (1), 158–170.
- Card, David and Thomas Lemieux, “Can Falling Supply Explain the Rising Return to College for Younger Men? A Cohort-Based Analysis,” *The Quarterly Journal of Economics*, 2001, 116 (2), 705–746.
- Center for Migration Studies, “Estimates of the Unauthorized Population,” 2014. Dataset based on the augmented American Community Survey datafiles hosted by IPUMS (Integrated Public Use Microdata Series), 2010 to 2014.
- Cho, Esther Yoona, “Revisiting Ethnic Niches: A Comparative Analysis of the Labor Market Experiences of Asian and Latino Undocumented Young Adults,” *RSF*, 2017.
- Edwards, Ryan and Francesc Ortega, “The Economic Contribution of Unauthorized Workers: An Industry Analysis,” *Regional Science and Urban Economics*, 2017, 67, 119–134.
- Gleeson, Shannon and Roberto G. Gonzales, “When Do Papers Matter? An Institutional Analysis of Undocumented Life in the United States,” *International Migration*, 2012, 50 (4), 1–19.
- Goldin, Claudia and Lawrence F. Katz, “Transitions: Career and Family Life Cycles of the Educational Elite,” *American Economic Review*, May 2008, 98 (2), 363–369.
- Gonzales, Roberto G., “Learning to Be Illegal: Undocumented Youth and Shifting Legal Contexts in the Transition to Adulthood,” *American Sociological Review*, 2011, 76 (4), 602–619.
- Hainmueller, Jens, Duncan Lawrence, Linna Martén, Bernard Black, Lucila Figueroa, Michael Hotard, Tomás R Jiménez, Fernando Mendoza, Maria I Rodriguez, Jonas J Swartz et al., “Protecting unauthorized immigrant mothers improves their childrens mental health,” *Science*, 2017, 357 (6355), 1041–1044.

- Hall, Matthew and Emily Greenman, "The Occupational Cost of Being Illegal in the United States: Legal Status, Job Hazards, and Compensating Differentials," *International Migration Review*, 2015, 49 (2), 406–442.
- , —, and George Farkas, "Legal Status and Wage Disparities for Mexican Immigrants," *Social Forces*, 2010, 89 (2), 491–513.
- Hirsch, Boris and Elke J. Jahn, "Is There Monopsonistic Discrimination against Immigrants?," *ILR Review*, May 2015, 68 (3), 501–528.
- Hotchkiss, Julie L. and Myriam Quispe-Agnoli, "Employer monopsony power in the labor market for undocumented workers," FRB Atlanta Working Paper 2009-14, Federal Reserve Bank of Atlanta 2009.
- Hsin, Amy and Francesc Ortega, "The Effects of Deferred Action for Childhood Arrivals on the Educational Outcomes of Undocumented Students: Evidence from a Large Public University," IZA Discussion Papers 11078, Institute for the Study of Labor (IZA) 2017.
- Kossoudji, Sherrie A. and Deborah A. Cobb-Clark, "Coming out of the Shadows: Learning about Legal Status and Wages from the Legalized Population," *Journal of Labor Economics*, July 2002, 20 (3), 598–628.
- Lofstrom, Magnus, Laura Hill, and Joseph Hayes, "Wage And Mobility Effects Of Legalization: Evidence From The New Immigrant Survey," *Journal of Regional Science*, 02 2013, 53 (1), 171–197.
- Lozano, Fernando A. and Todd A. Sorensen, "The Labor Market Value to Legal Status," IZA Discussion Papers 5492, Institute for the Study of Labor (IZA) February 2011.
- Lynch, Robert and Patric Oakford, "The Economic Effects of Granting Legal Status and Citizenship to Undocumented Immigrants," March 20 2013. Center for American Progress.
- Machado, Joel, "Dealing with Undocumented Immigrants: the WELfare Effects of Amnesties and Deportations," *Journal of Demographic Economics*, 2017, 83 (4), 445–492.
- Manacorda, Marco, Alan Manning, and Jonathan Wadsworth, "The Impact Of Immigration On The Structure Of Wages: Theory And Evidence From Britain," *Journal of the European Economic Association*, February 2012, 10 (1), 120–151.
- Monras, Joan, Javier Vzquez-Grenno, and Ferran Elias Moreno, "Understanding the Effects of Legalizing Undocumented Immigrants," IZA Discussion Papers 10687, Institute for the Study of Labor (IZA) April 2017.
- Orrenius, Pia M. and Madeline Zavodny, "The impact of E-Verify mandates on labor market outcomes," *Southern Economic Journal*, 2015, 81 (4), 947–959.
- and —, "Irregular immigration in the European Union," Working Papers 1603, Federal Reserve Bank of Dallas January 2016.
- Ottaviano, Gianmarco I. P. and Giovanni Peri, "Rethinking the Effect of Immigration on Wages," *Journal of the European Economic Association*, February 2012, 10 (1), 152–197.

- Passel, Jeffrey S. and D’Vera Cohn, “Share of Unauthorized Immigrant Workers in Production, Construction Jobs Falls Since 2007: In States, Hospitality, Manufacturing and Construction are Top Industries,” March 26 2015. Washington, D.C.: Pew Research Center.
- and Rebecca L. Clark, “Immigrants in New York: Their Legal Status, Incomes and Taxes,” 1998. Washington, DC: Urban Institute.
- Pastor, Manuel and Justin Scoggins, “Estimating the Eligible-to-Naturalize Population,” March 8 2016. Center for the Study of Immigrant Integration.
- Pope, Nolan G., “The Effects of DACAmentation: The Impact of Deferred Action for Childhood Arrivals on Unauthorized Immigrants,” *Journal of Public Economics*, 2016, 143 (C), 98–114.
- Van Hook, Jennifer, James D. Bachmeier, Donna L. Coffman, and Ofer Harel, “Can We Spin Straw Into Gold? An Evaluation of Immigrant Legal Status Imputation Approaches,” *Demography*, February 2015, 52 (1), 329–354.
- Warren, Robert, “Democratizing Data about Unauthorized Residents in the United States: Estimates and Public-Use Data, 2010 to 2013,” *Journal on Migration and Human Security*, December 2014, 2 (4), 305–328.
- and John Robert Warren, “Unauthorized Immigration to the United States: Annual Estimates and Components of Change, by State, 1990 to 2010,” *International Migration Review*, Summer 2013, 47 (2), 296–329.

Table 1: Data summary

	All	Docum.	Undoc.	Undoc17	Undoc17 HSG+	Undoc17 HSG+, 32-
Employed (%)	61	61	68	60	60	57
College (%)	11	11	6	12	22	25
Non-employed (%)	28	28	27	27	18	18
Total count (Mn)	232.43	222.03	10.40	2.93	1.65	1.42
Wage (\$)	20.61	20.82	16.39	14.73	15.94	14.40
as % Pop	100	95.53	4.47	1.26	0.71	0.61
as % Emp	100	95.53	4.99	1.24	0.70	0.57

Notes: The data are based on the 2012 American Community Survey (CMS version). We restrict to individuals age 17-70. Non-employed means not working and not in college. Total count refers to the estimated number of individuals in each column (in millions). Hourly wages computed on the basis of full-time workers (35 hours minimum worked usually) at year 2012 prices. Column 1 reports on the total population, including documented (US-born or foreign-born) and likely undocumented. Column 2 refers to (likely) documented individuals only. Column 3 refers to the (likely) undocumented individuals. Column 4 reports on unauthorized individuals who arrived in the country at age 17 or younger. Column 5 adds the additional restriction of having a high school diploma or equivalent. Column 6 adds the additional restriction of being less than 32 years old in year 2012.

Table 2: Baseline Data (2012 ACS) on documented population and DREAMers. Shares of column totals

Edu	Age	(1) Doc L	(2) Doc C	(3) Doc N	(4) U17 L	(5) U17 C	(6) U17 N	(7) U17HSG L	(8) U17HSG C	(9) U17HSG N
HSD	1	0.02	0	0.1	0.18	0	0.42	0	0	0
HSD	2	0.01	0	0.03	0.18	0	0.16	0	0	0
HSD	3	0.02	0	0.03	0.08	0	0.05	0	0	0
HSD	4	0.02	0	0.04	0	0	0	0	0	0
HSD	5	0.01	0	0.06	0	0	0	0	0	0
HSG	1	0.06	0.21	0.06	0.2	0.32	0.19	0.35	0.32	0.52
HSG	2	0.06	0.02	0.05	0.13	0.02	0.08	0.22	0.02	0.22
HSG	3	0.07	0.01	0.05	0.03	0	0.02	0.06	0	0.05
HSG	4	0.08	0.01	0.07	0	0	0	0	0	0
HSG	5	0.05	0	0.15	0	0	0	0	0	0
SoCo	1	0.06	0.37	0.02	0.09	0.51	0.03	0.17	0.51	0.09
SoCo	2	0.06	0.09	0.03	0.05	0.05	0.02	0.09	0.05	0.06
SoCo	3	0.06	0.04	0.03	0.01	0.01	0.01	0.02	0.01	0.01
SoCo	4	0.06	0.02	0.04	0	0	0	0	0	0
SoCo	5	0.04	0.01	0.08	0	0	0	0	0	0
CoGrad	1	0.03	0.08	0.01	0.02	0.06	0.01	0.04	0.06	0.03
CoGrad	2	0.08	0.07	0.02	0.02	0.03	0.01	0.04	0.03	0.02
CoGrad	3	0.08	0.03	0.03	0	0	0	0.01	0	0
CoGrad	4	0.08	0.02	0.03	0	0	0	0	0	0
CoGrad	5	0.06	0.01	0.09	0	0	0	0	0	0
Total (M)		134.78	24.03	63.23	1.77	0.37	0.8	0.99	0.37	0.29
Total (M)			222.03			2.93			1.65	

Notes: The population is restricted to ages 17-70 and is based on the 2012 ACS. Columns 1-3 refer to the documented population (born in the United States or abroad). Columns 4-6 refer to the likely unauthorized individuals that arrived in the country by age 17 (DREAMers), and columns 7-9 restrict to the subset of DREAMers with a high school diploma (or similar) in 2012. Education levels are defined as (HSD) high school dropouts, (HSG) high school graduates, (SoCo) some college education, and (CoGrad) college graduates. The age groups are defined as (1) 17-26, (2) 27-36, (3) 37-46, (4) 47-56 and (5) 57-70.

Table 3: Calibration productivity terms

Edu	Age	(1) $\theta_{e,a}^{Doc}$	(2) $\theta_{e,a}$	(3) θ_e
HSD	1	1.04	1	
HSD	2	1.18	2.02	
HSD	3	1.26	2.39	1
HSD	4	1.35	2.56	
HSD	5	1.39	2.28	
HSG	1	1.06	1	
HSG	2	1.26	1.87	
HSG	3	1.38	2.31	2.27
HSG	4	1.44	2.59	
HSG	5	1.59	2.19	
SoCo	1	1.04	1	
SoCo	2	1.32	2.27	
SoCo	3	1.46	2.89	2.65
SoCo	4	1.42	3.1	
SoCo	5	1.38	2.64	
CoGrad	1	1	1	
CoGrad	2	1	2.18	
CoGrad	3	1.07	3.09	5.58
CoGrad	4	1.44	3.4	
CoGrad	5	1.6	2.87	
Avg.		1.22		

Notes: Productivity terms based on the hourly wages of the corresponding full-time workers, assuming no exploitation. Column 1 reports the productivity (wage) of documented workers relative to undocumented workers who arrived as children in the same education and age groups. The average value reported in the last row uses the distribution of undocumented workers arrived as children over education-age groups as weights – the mode is 15% for HSD in age groups 2 and 3. Column 2 reports the productivity of each education-age type of labor, relative to the first age category in each of the education groups. Column 3 reports the productivity of each education group relative to the HSD category. The age groups are (1) 17-26, (2) 27-36, (3) 37-46, (4) 47-56 and (5) 57-70.

Table 4: Additional Parameters

Parameter values		
ϕ	0.56	DACA take-up rate
δ^C	0.07	Increased prob. of employment for college students
δ^N	0	Increased prob. of employment for ‘idle’ individuals
ψ	1	DREAM Act take-up rate
γ_2^L	0.50	Increased prob. of college enrollment for employed individuals
γ_2^N	0.50	Increased prob. of college enrollment for ‘idle’ individuals

Notes: Key parameter values. The scenario more consistent with the estimates by [Pope \(2016\)](#) is $\delta^C = 0$ and $\delta^N = 0.07$. And in any case we need to have $\delta^C + \delta^N = 0.07$.

Table 5: Effects of DACA on GDP

Scenarios	(1)	(2)	(3)	(4)	(5)
	Δ GDP pct. change	Δ GDP \$ Billions	Legalized All	Legalized Employed	Δ GDP \$ per worker
(1) No participation effect	0.0144	2.8	0.79	0.45	6,217
(2) College participants	0.0178	3.5	0.79	0.47	7,454
(3) Non-emp. participants	0.0170	3.3	0.79	0.46	7,181
(4) Universal take-up	0.0289	5.6	1.42	0.83	6,777
(5) Full exploitation	0.0032	0.6	0.79	0.47	1,340

Notes: The eligible group consists of likely unauthorized individuals that entered the country younger than 17 with a high school diploma (or equivalent), and were younger than 32 in year 2012, as required by DACA. Columns 3 and 4 report the number of legalized individuals in our simulation, considering only employed (column 4) or also individuals in college or non-employed (column 3). In scenario 1, $(\phi, \delta_C, \delta_N) = (0.56, 0, 0)$. In scenarios 2 and 5, $(\phi, \delta_C, \delta_N) = (0.56, 0.07, 0)$. In scenario 3, $(\phi, \delta_C, \delta_N) = (0.56, 0, 0.07)$. In scenario 4: $(\phi, \delta_C, \delta_N) = (1, 0.07, 0)$. The dollar amounts in column 2 are computed multiplying the pct. change in GDP in column 1 by the latest GDP estimate available – third quarter of 2017. The last column is the ratio of column 2 to column 5.

Table 6: Wage Effects of DACA. Percent changes relative to baseline

Edu group	Age group	(1)	(2)	(3)	(4)	(5)	(6)
		wage growth Doc-Doc Undoc-Undoc	labor shares Doc	wage growth by edu Doc-Doc	wage growth Legalized Undoc-Doc	labor shares DREAMers	wage growth by edu Legalized
HSD	1	0.01	0.24	0.00	.	0	.
HSD	2	0.01	0.17		.	0	
HSD	3	0.01	0.20		.	0	
HSD	4	0.01	0.23		.	0	
HSD	5	0.01	0.16		.	0	
HSG	1	-0.03	0.19	-0.01	5.96	0.68	12.43
HSG	2	-0.04	0.18		26.17	0.32	
HSG	3	0	0.21		.	0	
HSG	4	0	0.26		.	0	
HSG	5	0	0.16		.	0	
SoCo	1	-0.02	0.22	-0.01	3.98	0.72	11.73
SoCo	2	-0.02	0.22		31.64	0.28	
SoCo	3	0	0.21		.	0	
SoCo	4	0	0.22		.	0	
SoCo	5	0	0.14		.	0	
CoGrad	1	0	0.10	0.00	0.00	0.53	0.00
CoGrad	2	0.01	0.25		0.00	0.47	
CoGrad	3	0.01	0.25		.	0	
CoGrad	4	0.01	0.23		.	0	
CoGrad	5	0.01	0.17		.	0	

Notes: We report percent changes in DACA counterfactual relative to baseline. Doc-Doc (Undoc-Undoc) refers to individuals that were Documented (Undocumented) both in the baseline and in the counterfactual. Legalized individuals are those that had Undocumented status in the baseline but were Documented in the DACA counterfactual. Because documented and undocumented that do not change legal status with the same education and age are perfect substitutes in production, they experience identical wage growth rates. We use the baseline elasticities (scenario 2 in [Table 5](#)). Columns 1 and 4 report wage growth (in percent) by education-age. Columns 2 and 5 report the labor shares in the baseline among documented workers (column 2) and among DREAMers eligible for DACA (column 5). Columns 3 and 6 report age-weighted average wages by education on the basis of the respective previous two columns. A ‘.’ denotes a missing value due to the fact that there are no individuals in that education-age-documentation status category. The age groups are (1) 17-26, (2) 27-36, (3) 37-46, (4) 47-56 and (5) 57-70.

Table 7: Long-run effects of the DREAM Act on GDP

Scenarios	(1) ΔGDP pct. Change	(2) ΔGDP \$ billions	(3) Legalized - All Millions	(4) Legalized - Workers Millions	(5) ΔGDP \$ per worker
Legalization					
(1) $\gamma = 0$	0.05	9.0	1.65	0.99	9,104
(2) $\gamma = 0.50$	0.08	15.2	1.65	0.99	15,371
(3) $\gamma = 1$	0.11	21.3	1.65	0.99	21,519
Removal	-0.42	-81.5	2.93	1.77	-46,061

Notes: Scenarios 1-3 report the long-run gains in GDP associated with passing the DREAM Act when a fraction γ of DREAMers with a high-school degree chooses to enroll in college to obtain an associate degree (education level 3). In all scenarios the new graduates are assumed to work only if they were working in the baseline scenario. GDP amounts in columns 2 and 5 are in 2017 prices. Columns 3 and 4 report the number of individuals that obtain legalization according to our simulation (in millions), with the latter restricting to legalized individuals that are working in the long-run DREAM Act scenari. Column 5 is computed by dividing column 2 by column 4. The last row (Removal scenario) reports the change in GDP associated with removing all DREAMers (undocumented individuals that arrived as children).

Table 8: Wage Effects of DREAM Act. Percent changes relative to baseline

Edu	Age	(1) Doc % Δ wage	(2) Doc labor shares	(3) Doc % Δ wage	(4) Legalized % Δ wage	(5) Legalized labor shares	(6) Legalized % Δ wage
HSD	1	0.03	0.24	0.03	.	0	.
HSD	2	0.03	0.17		.	0	
HSD	3	0.03	0.20		.	0	
HSD	4	0.03	0.23		.	0	
HSD	5	0.03	0.16		.	0	
HSG	1	0.37	0.19	0.16	22.20	0.55	52.37
HSG	2	0.21	0.18		85.09	0.35	
HSG	3	0.1	0.21		115.36	0.09	
HSG	4	0.08	0.26		.	0	
HSG	5	0.08	0.16		.	0	
SoCo	1	-0.42	0.22	-0.22	3.56	0.61	15.33
SoCo	2	-0.34	0.22		31.21	0.32	
SoCo	3	-0.15	0.21		45.33	0.07	
SoCo	4	-0.08	0.22		.	0	
SoCo	5	-0.07	0.14		.	0	
CoGrad	1	0.03	0.10	0.03	0.03	0.42	0.67
CoGrad	2	0.03	0.25		0.03	0.49	
CoGrad	3	0.02	0.25		7.23	0.09	
CoGrad	4	0.03	0.23		.	0	
CoGrad	5	0.03	0.17		.	0	

Notes: The table reports long-run percent changes in wages in the DREAM Act scenario. Eligible individuals are required to have a high school diploma in the baseline data. Columns 1-3 refer to documented individuals (Doc), either foreign-born or US-born. Columns 4-6 refer to individuals that obtained legal status through the DREAM Act. Columns 1 and 4 report wage growth (in percent) by education-age. Columns 2 and 5 report the labor shares in the baseline among documented workers (column 2) and among DREAMers (column 5). Columns 3 and 6 report age-weighted average wages by education. A '.' denotes a missing value due to the fact that there are no individuals in that education-age-documentation status category. The simulation assumes that a fraction $\gamma = 0.50$ of high-school graduate DREAMers will obtain some college education (education level 3) in order to obtain legal permanent residence. Because documented and undocumented workers with the same education and age are perfect substitutes in production, they experience identical education-age specific wage growth rates. Thus column 2 can also be applied to undocumented workers that did not obtain legal status.

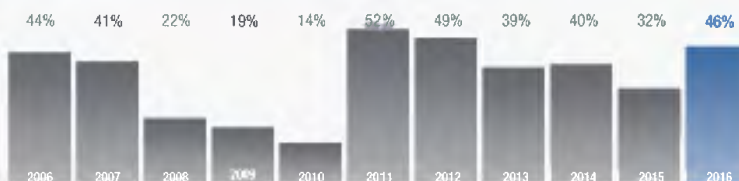
EXHIBIT 25



2016/2017 TALENT SHORTAGE SURVEY

THE UNITED STATES RESULTS

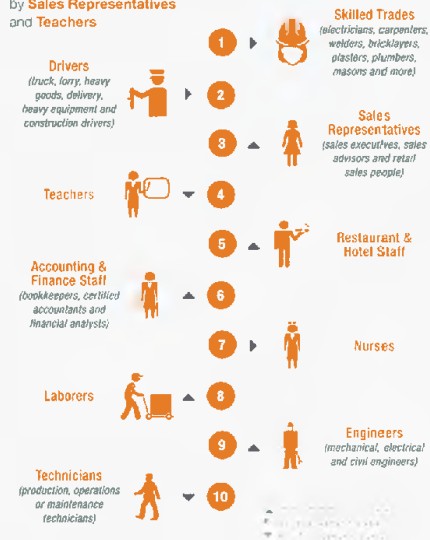
46% OF EMPLOYERS are having DIFFICULTY FILLING JOBS



The HARDEST SKILLS to find

For the seventh consecutive year, **Skilled Trades** are the hardest jobs to fill in the United States;

Drivers are in second place, followed by **Sales Representatives** and **Teachers**

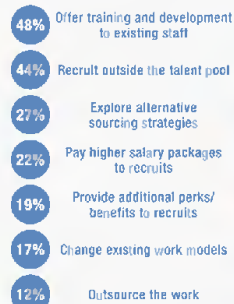


WHY employers say it's HARD TO FILL positions

Lack of available applicants and lack of experience are the top reasons employers can't fill positions



48% OF EMPLOYERS are TRAINING AND DEVELOPING EXISTING EMPLOYEES to fill open positions

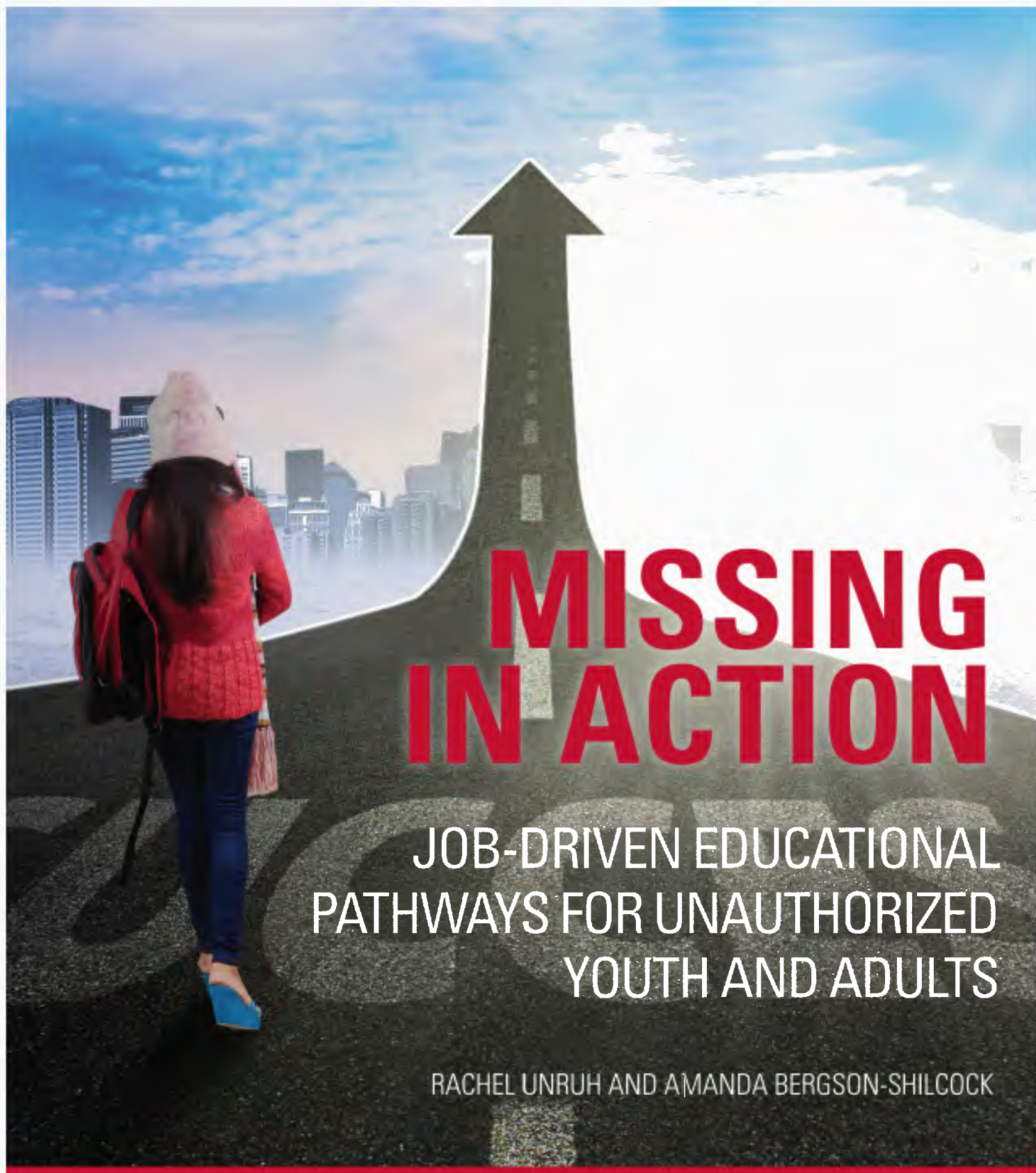


Employability depends less on what you already know and more on how well you can learn, apply and adapt

Mara Swan

EVP Global Strategy and Talent at ManpowerGroup

EXHIBIT 26



FEBRUARY 2015



NATIONAL SKILLS COALITION
Every worker. Every industry. A strong economy.

ACKNOWLEDGMENTS

This research was funded by the
Ford Foundation and WKF Family Fund.

We thank them for their support
but acknowledge that the findings
and conclusions presented in this
report are those of the authors alone,
and do not necessarily reflect the
opinions of the foundations.

TABLE OF CONTENTS

Introduction	2
The DREAM Act: A Journey to Citizenship without Job-Driven Educational Pathways	3
Deferred Action for Childhood Arrivals (DACA) and Deferred Action for Parents (DAPA): Job-Driven Educational Pathways without Capacity, Investments	6
Learning from DREAM, DACA and DAPA: Are we Ready for Comprehensive Reform?	8
DREAM, DACA, and DAPA as Scaffolding for Comprehensive Reform: Recommendations toward a Skills Strategy Now	10
Conclusion	12
Appendix	13

INTRODUCTION

There are an estimated 11.4 million unauthorized immigrants in the United States, representing more than 1 out of every 4 immigrants overall. Immigration policies aimed at deferring action on deportations – and even more so, those aimed at creating a path to citizenship – have tremendous economic potential for individuals and the nation as a whole. Without immigrants, the United States workforce will not be sufficient to replace the workers expected to retire from the labor force between 2010 and 2030.¹ The absence of immigrants in the workforce could impede the nation's ability to maintain current productivity, let alone to foster economic growth and opportunity.

Policymakers in Washington, DC, and in the states have put forward proposals to make it easier for immigrants to fully contribute to the economy. Most federal immigration policy proposals – whether administrative or congressional – require immigrant applicants to attain credentials, thus facilitating their full economic integration. These educational requirements – if supported by adequate policy infrastructure and investments – increase the likelihood of positive economic outcomes for individual immigrants and our economy as a whole. It is well-documented that higher levels of education are associated with higher earnings and economic productivity. But some of these credential requirements have not lined up with what the labor market actually demands, and to date, no policy has included the investments or infrastructure needed to support job-driven educational pathways for unauthorized youth and adults:

- The DREAM Act, which would provide an avenue to citizenship for certain youth and young adults, does not include middle-skill occupational training as an educational pathway. Industry recognized middle-skill certificates are an important pathway into the labor market for many immigrant youth, and are in great demand by employers.
- Twenty percent (426,000) of those who were otherwise potentially eligible for work authorization under President Obama's original Deferred Action for Childhood Arrivals (DACA) program, enacted in 2012, did not meet the educational requirements because they lacked a high school diploma and were not enrolled in school.² Without the work authorization granted by DACA, these young people are ineligible for the primary federally

Federal immigration policy has tremendous economic potential. But to realize that potential, these policies must support job-driven training leading to middle-skill credentials, and policymakers must address the infrastructure and investments necessary for the policies to succeed.

funded occupational training program, the Workforce Innovation and Opportunity Act (WIOA) Title I, which, when blended with Title II (Adult Education and Family Literacy Act) funds, can help out-of-school youth and adults improve their basic skills and English in the context of occupational training.

- For those who *do* qualify for WIOA Title I services, including those adults impacted by the President's recent Deferred Action for Parents of Americans and Lawful Permanent Residents (DAPA), significant underfunding of these programs constrains the potential economic impact of DACA and DAPA for individuals and the nation as a whole.

In short, federal immigration policy has tremendous economic potential. But to realize that potential, these policies must support job-driven training leading to middle-skill credentials, and policymakers must address the infrastructure and investments necessary for the policies to succeed.

Over the longer term, the same capacity and infrastructure issues that make it challenging for DACA and DAPA participants to pursue job-driven educational pathways could also become barriers to these participants' ability to attain U.S. citizenship if comprehensive immigration reform legislation passes. The Border Security, Economic Opportunity, and Immigration Modernization Act (S.744) passed by the Senate in 2013 will likely serve as a model for any eventual comprehensive legislation. That bill established a thirteen-year pathway to earned citizenship, which included a number of benchmarks related to employment, earnings, education, and English language acquisition.

Reflecting on the DREAM Act, DAPA, and DACA today creates an opportunity to ensure that the current lack of access to job-driven educational pathways does not become a barrier to citizenship in

the future when comprehensive immigration reform comes to pass. What's more, with the impending implementation of the newly reauthorized WIOA, now is a particularly important time for the workforce development and immigrant integration communities to proactively engage in conversations with each other and with local, state, and federal policymakers about creating job-driven educational pathways for a significant and essential segment of America's current and future workforce: unauthorized youth and adults.

THE DREAM ACT: A JOURNEY TO CITIZENSHIP WITHOUT JOB-DRIVEN EDUCATIONAL PATHWAYS

With a legislative history going back more than a decade, the Development, Relief, and Education for Alien Minors Act (DREAM Act), would create an avenue to citizenship for a certain set of unauthorized youth and young adults. While provisions of that pathway have changed in iterations of the bill over the last 13 years, the legislation has generally required young people to have a high school diploma or equivalent, and be enrolled in or have completed a two- or four-year degree or military service. Versions of the DREAM Act, which have generally garnered bi-partisan support, have been incorporated into comprehensive immigration reform bills including most recently in the 2013 Senate-passed S. 744.

Under the 2010 version of the DREAM Act, 1.9 million unauthorized youth and young adults would be eligible under the non-educational requirements: age, time in the U.S., and age at arrival. But only 38 percent (755,000) of these 1.9 million individuals had achieved the additional higher education or military service requirements that would be necessary to access the DREAM Act's path to citizenship. Only 4 percent (78,000) of the 1.9 million had completed an associate's degree or higher (Table 1).³ This means that in 2010, based on the pending DREAM Act, fully 1.1 million youth and young adults would have needed to pursue a two-year or four-year degree or military service to meet the bill's requirements.

Unfortunately, the DREAM Act does not include middle-skill occupational training as an allowable educational pathway. There are a number of industry recognized middle-skill certificates obtained through occupational training programs that can lead to good employment. Many of these certificates allow people to obtain jobs with good wages – jobs that are crucial to all of our lives (Table 2).

As such, the DREAM Act's provisions are not job-driven – that is, they do not reflect the educational outcomes demanded by the labor market. Eighty percent of job openings over the next decade will require a postsecondary credential, and the largest portion (nearly half) will require a middle-skill credential (Table 3). Key industries are unable to find enough sufficiently trained workers to fill these jobs, which require more than a high school diploma but not a four-year degree. In 2012, middle-skill jobs accounted for 54 percent of

TABLE 1. THE DREAM ACT UNIVERSE

Under the 2010 version of the DREAM Act, over one million youth and young adults would have needed to pursue postsecondary education or military service to meet the bill's requirements.

- 1.9 million meet baseline age, time in the U.S., and age of arrival requirements
- 755,000 also meet higher education or military requirements
- 78,000 have completed an associate's degree or higher



**TABLE 2. MIDDLE-SKILL CERTIFICATES:
CAN'T LIVE WITHOUT THEM**

There are a number of industry recognized certificates obtained through occupational training programs that can lead to good employment. Many of these certificates allow people to obtain jobs with good wages – jobs that are crucial to all of our lives.

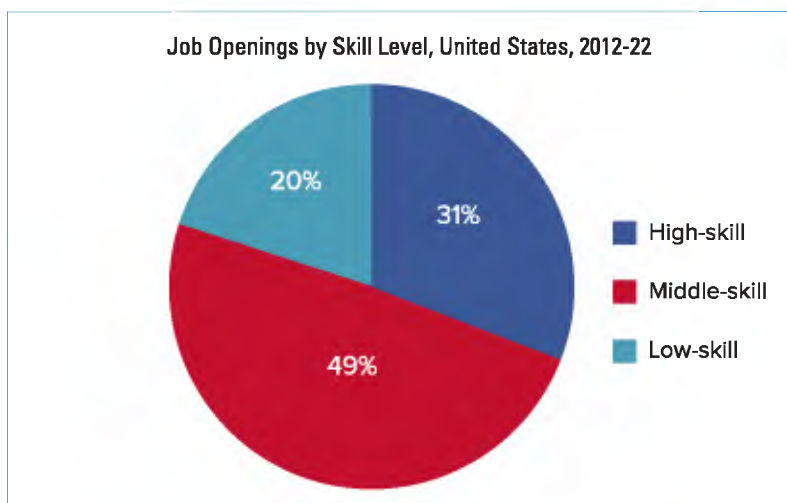
Source: Bureau of Labor Statistics Employment Projections. Typical entry needed for example occupations is postsecondary non-degree credential.

OCCUPATION	JOB OPENINGS 2012-22 (in thousands)	MEDIAN ANNUAL WAGE
Licensed practical nurses	363.1	\$41,540
Heating, air conditioning, and refrigeration mechanics and installers	123.7	\$43,640
Aircraft mechanics and service technicians	35.6	\$55,210
Heavy and tractor-trailer truck drivers	464.7	\$38,200

**TABLE 3. DEMAND FOR MIDDLE-SKILL
JOBS WILL REMAIN STRONG**

Between 2012-2022, 49 percent of job openings nationwide will be middle-skill.

Source: NSC analysis of long-term occupational projections from Bureau of Labor Statistics.



the U.S. labor market, but only 44 percent of the country's workers were trained to the middle-skill level (Table 4).⁴

The absence of middle-skill occupational training as an allowable educational pathway limits the DREAM Act's potential to help address the middle-skill gap in the labor market, and it also limits the Act's economic payoff for individuals. Middle-skill certificates offer a pathway to gainful employment and further postsecondary education for many individuals. Those with a middle-skill certificate earn 20 percent more than those with a high school diploma.

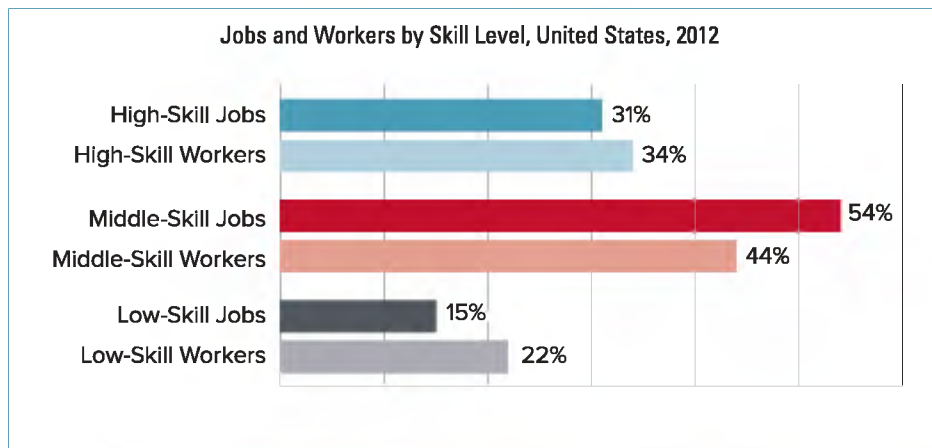
Individuals who work in the field of their credential often earn more than the median holder of an associate's degree and can earn as much or more as the median bachelor's degree holder. The wage premium for a middle-skill certificate is particularly high for Hispanic workers (Table 5).⁵

The inclusion of educational requirements in the DREAM Act increases the likelihood of positive economic outcomes for individuals and the economy. But these positive outcomes are constrained because middle-skill occupational training is not an allowable

TABLE 4. A MIDDLE-SKILL GAP

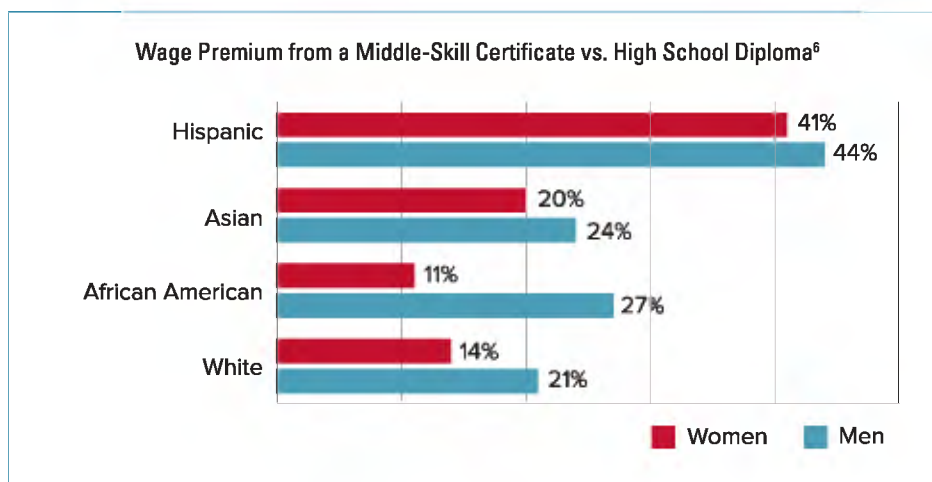
Middle-skill jobs account for 54 percent of United States' labor market, but only 44 percent of the country's workers are trained to the middle-skill level.

Source: NSC analysis of BLS Occupational Employment Statistics by State, May 2012 and ACS data, 2012

**TABLE 5. MIDDLE-SKILL CERTIFICATES PAY**

The wage premium from a middle-skill certificate compared to a high school diploma is particularly significant for Hispanic workers.

Source: Anthony P. Carnevale, Stephen J. Rose and Andrew R. Hanson. *Certificates: Gateway to Gainful Employment and College Degrees*.



educational pathway. While the specific examples vary by region, local economies are being held back because of a shortage of individuals with relevant middle-skill credentials in certain key industries. For example, a recent analysis found that there is a high demand for individuals with middle-skill credentials in Houston's petrochemical and commercial/industrial construction industries. In New York City, the healthcare and technology industries are being held back by a shortage of individuals with industry recognized middle-skill credentials.⁷

The lack of a middle-skill occupational training pathway in the DREAM Act is not only out of step with economic trends, it is also out of step with the direction of recent federal policy – both congressional and administrative – which is increasingly recognizing the need to focus on closing the middle-skill gap and to support the types of learning models that make it easier for individuals to stack credentials and build competencies over time.



DREAMS OF A MIDDLE PATHWAY: SAMUEL

Samuel came to the U.S. from Mexico as a young boy in 1999. Family economic hardships prevented him from finishing high school, but he seized other opportunities. Samuel earned his GED and enrolled in a nationally accredited HVAC technician training program at the Center for Employment Training in Sacramento. He will soon be prepared for a high-growth family-sustaining job that is essential to his community. While Samuel's middle-skill credential will have economic payoff for him and his employer, it is not recognized as a valid educational outcome within the DREAM Act.

DEFERRED ACTION FOR CHILDHOOD ARRIVALS (DACA) AND DEFERRED ACTION FOR PARENTS (DAPA): JOB-DRIVEN EDUCATIONAL PATHWAYS WITHOUT CAPACITY, INVESTMENTS

In 2012, following a breakdown in negotiations over the DREAM Act, President Obama took administrative steps to defer action on deportation for the population of youth and young adults targeted by the DREAM Act. The Deferred Action for Childhood Arrivals (DACA) program allows youth and young adults who meet its requirements

to obtain temporary reprieve from deportation, work authorization, and lawful presence under federal immigration law. DACA is a temporary administrative program and does not provide a pathway to legal permanent residency or citizenship, both of which require congressional action. As of July 2014, more than 580,000 individuals had received deportation relief and work authorization under DACA.⁸

In November 2014, the President took further administrative action, expanding the pool of individuals eligible for deferred action on deportation and work authorization to nearly half of the 11.4 million individuals in the unauthorized population – an estimated 5.2 million people. The President's action brought an additional 290,000 young people into the pool of immediately eligible DACA youth by eliminating the age cutoff (previously applicants had to be under age 31) and adjusting the U.S. residency requirement from 2007 to 2010. This action expands the number of immediately eligible youth to approximately 1.5 million. The President also announced a new program, Deferred Action for Parents of Americans and Lawful Permanent Residents (DAPA), which would allow approximately 3.7 million parents of United States citizens or legal permanent residents to apply for deferred action on deportation and work authorization for a three-year period.⁹

Both the DACA and DAPA programs have elements in common with the DREAM Act proposal, and elements that are different. DACA mirrors the non-educational criteria in the DREAM Act, but its educational criteria are significantly broader. An individual must have served in the military or have a high school diploma or GED or must be currently in school. The in-school requirement is notably broad and includes “an education, literacy, or career training program (including vocational training) that is designed to lead to placement in postsecondary education, job training, or employment” or “an education program assisting students either in obtaining a regular high school diploma or its recognized equivalent.” In contrast, the newer DAPA program does not include any educational criteria.

The DACA Catch-22: Out of School Youth and Young Adults without a Diploma or GED

DACA's broad education requirements allow more individuals to qualify for DACA than would have qualified for the DREAM Act.

In particular, DACA has the potential to reach those who do not have a high school diploma or GED, as long as they are enrolled in an adult education or occupational training program leading to a GED or high school diploma, or leading to placement in postsecondary education/training or employment. By recognizing middle-skill occupational training as a valid educational pathway, DACA is more job-driven and has the potential for greater economic payoff than the DREAM Act.

However, the intersection between DACA's programmatic structure and the structure of the primary federal program that supports these expanded educational pathways creates a barrier for close to half a million youth and young adults who do not currently meet DACA's educational requirements.

According to the Migration Policy Institute, approximately 1.2 million young people met all of DACA's criteria at the time of launch in 2012. A majority of these individuals, 856,000, had secured a high school diploma or GED. An additional 426,000 individuals met DACA's age-at-arrival and length of residency criteria but did not meet educational criteria – they did not have a high school diploma and were not enrolled in school. Over two-thirds of these individuals had limited English proficiency.¹⁰ The President's 2014 expansion of DACA has increased the pool of immediately eligible individuals to 1.5 million.

How best to move potentially eligible DACA youth who do not have a diploma and are not in school onto a job-driven educational pathway? Recent practice and research suggest that the most effective way to move individuals without a GED or with low reading, math or English language skills toward a credential with labor market value is through integrated training models that combine instruction in basic reading and math skills and/or English with occupational training.

One such integrated model is Washington State's I-BEST program. A Columbia University evaluation found that I-BEST students are 56 percent more likely than standard adult basic education and ESL students to earn college credit, and 26 percent more likely to earn a certificate or degree.¹¹ An earlier evaluation by Public/Private Ventures found that a set of sector-focused community-based training programs showed significant positive outcomes for workers, including earnings gains, steadier employment, and increased access to health care and other benefits compared to programs that

DACA has the potential to reach those who do not have a high school diploma or GED, as long as they are enrolled in an adult education or occupational training program leading to a GED or high school diploma, or leading to placement in postsecondary education/training or employment.

did not use a sector-focused model. One commonality of all the programs evaluated was the provision of integrated training, including technical job-specific training and support to strengthen English and basic math skills.¹²

These types of integrated programs typically require a blending of federal funding streams, particularly those under the Workforce Innovation and Opportunity Act (WIOA). As described above, WIOA is the primary federal program that supports the types of job-driven educational pathways that would allow individuals without a high school diploma or GED to meet DACA's in-school requirements and work toward gainful employment. WIOA Title I supports occupational training and WIOA Title II (the Adult Education and Family Literacy Act) supports GED preparation, basic skills education, and ESL. In recognition of the evidence of effectiveness of integrated learning models, the recently reauthorized WIOA includes an even greater emphasis on blending these services.

Enrolling in a basic WIOA Title II ABE/ESL program would allow otherwise DACA-eligible youth without a diploma or GED to meet their in-school requirement and become work authorized. Unlike other WIOA titles, Title II is available to individuals without work authorization. But research suggests that positive employment outcomes are more likely if these individuals enroll in integrated programs that provide basic education or ESL (WIOA Title II) in the context of occupational training (WIOA Title I).

However, to access integrated programs that are partially funded by WIOA Title I, individuals must *first* be work authorized. The intersection of DACA's in-school requirement and WIOA Title I's work-authorization requirement creates a Catch-22 that makes it challenging for over 400,000 youth and young adults to benefit from DACA and contribute more fully to the economy.

Inadequate Capacity: Limited Pathways for Work Authorized Individuals under DACA and DAPA

For the 1.5 million youth and young adults who meet all of the expanded DACA's requirements, and for the 3.7 million potentially eligible DAPA individuals, work authorization creates an opportunity to advance on job-driven pathways through WIOA Title I-funded occupational training programs, including those integrated with WIOA Title II-funded ABE/ESL. At the time of DACA's initial launch in 2012, forty-one percent (510,000) of the immediately eligible population had a high school diploma or GED but were not enrolled in a postsecondary education or training program. And 28 percent of the immediately eligible were Limited English Proficient.¹³ However, after DACA was announced in 2012, there was some confusion at the local level as to whether DACA youth are eligible for services under WIOA and its predecessor, the Workforce Investment Act (WIA).

In an effort to eliminate this confusion, in July 2014, the United States Department of Labor issued guidance clarifying that under WIA's non-discrimination provisions, work-authorized DACA participants are eligible for all WIA and Wagner-Peyser programs. This was an important step in ensuring that DACA could realize its full economic impact as it created greater access to job-driven educational pathways for DACA youth and young adults.

With the recent reauthorization of WIA (now WIOA), the expansion of DACA, and the implementation of DAPA, it will be important for the administration to clarify once again that work-authorized individuals are eligible for WIOA-funded services.

Even with new guidance, however, the ongoing underfunding of WIOA creates a barrier to realizing DACA and DAPA's full economic potential. Adjusted for inflation, funding for WIOA Title II services has declined by nearly 24 percent since 2003, and the number of individuals served nationwide has declined by one million (30 percent) since 2000. Currently, the program reaches only 1.7 million adults and out-of-school youth each year, which is alarming in the context of the overall need for ABE/ESL services: In the U.S., 36 million individuals between the ages of 16 and 65 have low literacy skills, 62 million have low numeracy skills, and 12.4 million do not speak English well or at all.¹⁴

In the U.S., 36 million individuals between the ages of 16 and 65 have low literacy skills, 62 million have low numeracy skills, and 12.4 million do not speak English well or at all.

Funding for WIOA Title I services has likewise declined. Federal and state policymakers as well as the private sector must make significant new investment in these programs.

LEARNING FROM DREAM, DACA AND DAPA: ARE WE READY FOR COMPREHENSIVE REFORM?

While the nation waits for comprehensive immigration reform, it is important to reflect on what we can learn from the DREAM Act as well as DACA and DAPA to inform future legislation. The DREAM Act will likely be included in any comprehensive package. The immigration and workforce development fields can't wait until legislation is on the floor to make the case to policymakers that the DREAM Act needs to recognize middle-skill occupational certificates as valid and economically essential. The time to make that case is now.

Likewise, the capacity and infrastructure issues that already make it challenging for DACA and DAPA participants to pursue job-driven educational pathways could become barriers to citizenship for these and other unauthorized immigrants if comprehensive legislation eventually passes. As described above, the Border Security, Economic Opportunity, and Immigration Modernization Act (S.744) passed by the Senate in 2013 will likely serve as a model for any eventual comprehensive legislation.

The bill establishes a minimum 13-year pathway to earned citizenship for formerly unauthorized immigrants, a population which would include many (but not all) of the 11.4 million unauthorized individuals in the U.S. today. The pathway requires immigrants to meet a series of benchmarks related to employment, earnings, education, and English proficiency as they progress through temporary to permanent immigrant status and then eventual citizenship.¹⁵ Key benchmarks include:

Year 6: To Renew Registered Provisional Immigrant (RPI) Status

- Continuous employment (unemployed no more than 60 consecutive days at a time)
- *Or* can prove income or resources at or above 100 percent of the federal poverty level
- *Or* enrolled in “full-time” education and training

Year 10: To Adjust to Lawful Permanent Resident (LPR) Status

- Continuous employment (unemployed no more than 60 consecutive days at a time)
- *Or* can prove income or resources at or above 125 percent of the federal poverty level
- *Or* enrolled in “full-time” education and training
- *And* demonstrate the level of English proficiency and knowledge of U.S. history/civics that is required for citizenship or be pursuing a course of study that is designed to lead to such proficiency/knowledge.¹⁶

Significantly, S. 744 establishes a broad definition of education and training that acknowledges the range of programs that are essential to building a skilled workforce. These include institutions of higher education and secondary education as well as nonprofit and community-based education, literacy, or career training programs (including vocational training) that are designed to lead to placement in postsecondary education, job training, or employment, as well as programs assisting students in obtaining a high school diploma, its recognized equivalent, or in passing a GED/equivalent.

Data on the current employment, income, and English proficiency of the 11.4 million undocumented individuals who could be affected by immigration reform (as well as other immigrants currently awaiting green cards or other adjustments of status) suggests that significant resources will be necessary to help people not only meet the mandates under the legislation, but also to meet the skill needs of employers and to start on a career pathway to family sustaining employment.

About 90 percent of the 7.6 million undocumented individuals over the age of 16 in the U.S. labor force are employed. However, many

unauthorized immigrants in the workforce – just like many U.S. citizens in the workforce – lack the skills they need to obtain high-demand jobs that pay a family-supporting wage. Fifty percent of unauthorized adults do not have a high school diploma or GED, and over half of the unauthorized population has limited English proficiency. There are 3.5 million unauthorized individuals (31 percent) living below the poverty line.¹⁷ Substantial resources and infrastructure will be necessary to address the adult education, English language, occupational training, and employment needs of immigrant workers and citizens alike, as well as the needs of employers who need skilled workers.

Unfortunately, within immigration policy debates, the process of *immigrant integration* often gets less attention compared to issues such as enforcement and border security. Commonly defined as having three pillars – linguistic, civic, and economic – immigrant integration is the process by which newcomers become incorporated into American society. Yet although high-quality integration is a powerful engine driving economic inclusion and family success, its importance is often overlooked.

Even within the smaller world of immigrant integration policy debates, workforce skills are sometimes seen as something that can be addressed once more immediate concerns like application fees and paperwork are resolved. But in truth, an intentional, pro-active skills strategy within immigrant integration policy will amplify the effects of other integration activities, and increase the likelihood of overall individual and community success.

Policymakers and advocates within the immigration, adult education, and workforce development fields simply can’t wait until the day when comprehensive reform passes to address these issues. The field must start now to build momentum and political will for a comprehensive skills strategy. That strategy will require local and state policy efforts and investments. But it will also require some creative thinking within the context of federal policy and that thinking has to happen now. If we wait to tackle these issues after comprehensive reform happens, millions of individuals will be cut off from the pathway to citizenship and to fully contributing to the economy.

DREAM, DACA, AND DAPA AS SCAFFOLDING FOR COMPREHENSIVE REFORM: RECOMMENDATIONS TOWARD A SKILLS STRATEGY NOW

Immigration policy has the potential to bring about tremendous economic benefit for individuals and the economy as a whole. But to realize this potential, both existing and new policies must support job-driven educational pathways, and policymakers must invest in the capacity needed to support those pathways. Below, we outline specific recommendations for improving current policy proposals and programs.

DREAM Act

Make educational pathways job-driven: Expand the educational requirements in the DREAM Act to include industry recognized middle-skill credentials obtained through occupational training so that the policy can achieve its full potential economic impact for individuals and the nation as a whole. Allowable programs of study should include those that help individuals obtain a high school diploma or raise basic literacy or English language skills in the context of occupational training, as well as stand-alone middle-skill occupational training programs that lead to an industry recognized credential.

DACA and DAPA

Break the WIOA Title I/Work Authorization Catch-22: Under DACA, enrolling in WIOA-funded programs would allow the 423,000 individuals without a diploma or GED to obtain work authorization. However, to enroll in integrated programs that build basic skills in the context of training for an occupation (specifically programs that draw on WIOA Title I funds), they must first be work authorized. The administration should explore options to break through this barrier through administrative action.

Re-issue guidance affirming access to WIOA for work-authorized individuals: In July 2014, the U.S. Department of Labor issued guidance clarifying that under WIA's non-discrimination provisions, work-authorized DACA participants are eligible for WIA and Wagner-Peyser programs. With the reauthorization of WIA (now WIOA), the expansion of DACA, and the announcement of DAPA, it is important for the administration to clarify once again,

that work-authorized DACA and DAPA participants are eligible for services under WIOA.

Interagency Taskforce on Immigrant Integration

When the President announced his executive actions on DACA and DAPA in November 2014, he also called for the creation of the Interagency Taskforce on Immigrant Integration, which is required to issue an integration plan within 120 days. The United States Departments of Labor and Education are mandated partners on this taskforce and should play an active and vocal role to ensure that issues related to positive employment outcomes and advancement opportunities for those with work authorization receive equal attention to other integration issues.

WIOA Implementation

The newly reauthorized WIOA creates some important opportunities for immigrant workers. At a programmatic level, it explicitly calls for ABE/ESL programs under Title II to work toward employment outcomes, and encourages (and tries to eliminate the barriers to) blending of ABE/ESL (Title II) and occupational training (Title I) funding – a program model that is proven to increase the likelihood of positive employment outcomes. In addition, in codifying the integrated English Literacy and Civics education (IEL/CE) program, it explicitly calls for a connection to employment outcomes. Programs are supposed to prepare English language learners for, and place them in, unsubsidized employment in in-demand industries and occupations that lead to economic self-sufficiency.

At a systems level, WIOA promotes alignment between Title I (training) and Title II (ABE/ESL) by mandating unified plans that are jointly developed by the state entities administering the four titles under WIOA. This increases the likelihood of career pathways for individuals with low basic skills and/or limited English proficiency. It also explicitly calls for the newly codified/employment focused integrated English Literacy and Civics education (IEL/CE) program to integrate with the local workforce development system and its functions to carry out the program. This increases the likelihood that immigrants will have access to career pathways that support employment advancement.

Of course, there can be a great distance between legislative intent and implementation. Realizing the potential of WIOA for immigrant workers will require the following support from states:

Pursue authentic stakeholder engagement, including immigration and adult basic education/ESL stakeholders. States need to authentically engage stakeholders in the WIOA planning process. In particular, WIOA establishes common performance metrics that include employment outcomes as well as learning gains. Immigration advocates and providers of adult basic education and ESL need to weigh in on how those new standards are implemented so as to encourage positive employment outcomes without disincentivizing service to those with the lowest literacy, numeracy, and English language skills.

Engage in authentic unified planning. States need to bring all the necessary entities to the table in developing their unified plan. State administrators of all WIOA titles should be a part of planning discussions at the very beginning and throughout the process.

Consider the potential of combined plans to better support upskilling immigrant workers. States have the choice of either submitting a unified plan that includes WIOA's four titles *or* a combined plan that also includes operational components required by federal agencies for other programs, such as Career and Technical Education (CTE), Community Development Block Grants (CDBG), Supplemental Nutrition Assistance Program Employment and Training (SNAP E&T), and Temporary Assistance for Needy Families (TANF). Having a combined plan will help coordinate the efforts of agencies and programs and align programs that are better able to serve individuals with low basic skills and limited English proficiency. This alignment can increase the likelihood of successful outcomes for this population in ABE/ESL and workforce training programs.

While individuals under DACA and DAPA are notably not eligible to receive assistance from federally funded programs like TANF and SNAP E&T, some states have separate state resources for these purposes that *are* available to DACA participants. For example, in New York, DACA participants are eligible for state-funded benefits, including cash assistance through the Safety Net program.¹⁸ A combined state planning process can help ensure that these state resources are aligned with federal resources to support successful

A combined state planning process can help ensure that these state funded resources that supplement federal resources are aligned to support successful outcomes for DACA and DAPA individuals enrolled in ABE/ESL or workforce training programs.

outcomes for DACA and DAPA individuals enrolled in ABE/ESL or workforce training programs. What's more, should comprehensive immigration reform come to pass, combined plans will help ensure that states are better positioned to engage in a skills strategy that allows those on a path to citizenship to fully contribute to the economy.

Funding and Capacity

Fund WIOA at authorized levels: Unlike its predecessor WIA, which simply specified that the program would be funded by Congress using "such sums as necessary," WIOA includes specific funding levels for each fiscal year from 2015 through 2020. Congress must take steps to ensure that programs will be fully funded at authorized levels.

Leverage Comprehensive Immigration Reform (CIR) to support a national skills strategy: Ultimately, to ensure our economic future, the nation needs a congressionally authorized comprehensive approach to immigration reform. To ensure this legislation realizes its potential to foster economic growth and opportunity, it must be accompanied by an equally ambitious investment in skills, far greater than what has previously been proposed. National Skills Coalition has put forth a proposal for three new grant programs that could be implemented within the most recent Senate-passed comprehensive immigration reform bill that would dramatically increase the resources available for skills training for those working toward citizenship, as well as current United States citizens, without increasing the cost of the bill.¹⁹

CONCLUSION

Immigration policy has the potential to make it easier for millions to fully contribute to growing the economy. Including educational requirements in immigration proposals can help increase the likelihood of positive outcomes for individuals and the economy but only if these requirements are in line with labor market demand and only if they are supported by adequate policy infrastructure and investments. In the short-term, WIOA implementation creates an opportunity to ensure that job-driven pathways are more available to those impacted by DACA and DAPA. Longer-term, policymakers need to consider ways to make the DREAM Act more responsive to labor market demand for middle-skill credentials

and develop a comprehensive skills strategy within eventual comprehensive immigration reform – a strategy that can help those on a pathway to citizenship as well as current citizens pursue the skills needed to help their families and America prosper. While comprehensive reform may be a longer-term proposition, we can't wait to develop a comprehensive skills strategy. If we wait to develop that strategy and if we don't immediately work to ensure WIOA implementation is informed by immigration and adult basic education communities, the positive economic impact of immigration policy will be missing in action.

APPENDIX: EMPLOYMENT AND EDUCATION-RELATED REQUIREMENTS IN CONGRESSIONAL PROPOSALS AND ADMINISTRATIVE ACTIONS

While DACA has minimal education requirements and DAPA has no education requirements, for these policies to realize their economic potential, there need to be opportunities for impacted individuals to build skills that are in demand in the labor market. What's more, immigration, adult education, and workforce development stakeholders as well as policymakers need to be developing a skills strategy now that will make it possible for immigrants to meet the employment, earnings, education, and English requirements under eventual comprehensive reform so that it can realize its economic potential.

	EMPLOYMENT	EARNINGS	EDUCATION	ENGLISH
Congressional Action (Pathway to Citizenship)				
DREAM Act			AA/BA	
S. 744 (Senate-passed CIR bill)				
Year 6: To Renew Registered Provisional Immigrant (RPI) Status	Continuous employment (unemployed no more than 60 consecutive days at a time)	<i>Or</i> can prove income or resources at or above 100 percent of the federal poverty level	<i>Or</i> enrolled in "full-time" education and training	
Year 10: To Adjust to Lawful Permanent Resident (LPR) Status	Continuous employment (unemployed no more than 60 consecutive days at a time)	<i>Or</i> can prove income or resources at or above 125 percent of the federal poverty level	<i>Or</i> enrolled in "full-time" education and training	<i>And</i> demonstrate the level of English proficiency and knowledge of U.S. history/civics that is required for citizenship <i>or</i> be pursuing a course of study that is designed to lead to such proficiency/knowledge
Executive Action (No Pathway to Citizenship)				
DACA	None	None	Diploma/GED or in school	None
DAPA	None	None	None	None

NOTES

- ¹ Dowell Myers, Stephen Levy, and John Pitkin. *The Contributions of Immigrants and Their Children to the American Workforce and Jobs of the Future*. Center for American Progress. June 19, 2013. <https://www.americanprogress.org/issues/immigration/report/2013/06/19/66891/the-contributions-of-immigrants-and-their-children-to-the-american-workforce-and-jobs-of-the-future/>
- ² Jeanne Batalova, Sarah Hooker, Randy Capps and James D. Bachmeier. *DACA at the Two-Year Mark: A National and State Profile of Youth Eligible and Applying for Deferred Action*. Migration Policy Institute. August 2014. <http://www.migrationpolicy.org/research/daca-two-year-mark-national-and-state-profile-youth-eligible-and-applying-deferred-action>
- ³ Jeanne Batalova and Margie McHugh. *MPI Updates National and State-Level Estimates of Potential DREAM Act Beneficiaries*. Migration Policy Institute. December 2010.
- ⁴ For national and state data on middle-skill jobs and the middle-skill gap, see *Forgotten Middle-Skill Jobs: State by State Snapshots*. National Skills Coalition. August 2014. <http://www.nationalskillscoalition.org/state-policy/fact-sheets>
- ⁵ Anthony P. Carnevale, Stephen J. Rose and Andrew. R. Hanson. *Certificates: Gateway to Gainful Employment and College Degrees*. Georgetown University Center on Education and the Workforce. June 2012. <http://cew.georgetown.edu/certificates>
- ⁶ Anthony P. Carnevale, Stephen J. Rose and Andrew. R. Hanson. *Certificates: Gateway to Gainful Employment and College Degrees*. Georgetown University Center on Education and the Workforce. June 2012. <http://cew.georgetown.edu/certificates>
- ⁷ JPMorgan Chase, New Skills at Work Initiative. *Closing The Skills Gap: Preparing New Yorkers For High-Growth, High-Demand, Middle-Skill Jobs*. October 2014.

JPMorgan Chase, New Skills at Work Initiative. *Preparing Houston To Skill Up: Addressing The Skills Mismatch To Meet Employer Demand In High-Growth Industries*. November 2014.
- ⁸ Batalova et al. *DACA at the Two-Year Mark*.
- ⁹ *National and State Estimates of Populations Eligible for Anticipated Deferred Action and DACA Programs*. Migration Policy Institute. November 2014. <http://my.migrationpolicy.org/salsa/track.jsp?v=2&c=QnYf6BNkRTBzqG1DcKPvJpPAGjrTx3qc>
- ¹⁰ Batalova et al. *DACA at the Two-Year Mark*.
- ¹¹ Matthew Zeidenberg, Sung-Woo Cho, and Davis Jenkins. *Washington State's Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness*. Community College Research Center. 2010.
- ¹² Sheila Maguire, Joshua Freely, Carol Clymer and Maureen Conway. *Job Training that Works: Findings from the Sectoral Employment Impact Study*. P/PV. 2009. http://www.issuelab.org/resource/job_training_that_works_findings_from_the_sectoral_employment_impact_study
- ¹³ Batalova et al. *DACA at the Two-Year Mark*.
- ¹⁴ OECD's 2013 Program for the International Assessment of Adult Competencies.
- ¹⁵ The Senate bill allows for waivers to these requirements for individuals who can show extreme hardship
- ¹⁶ The Senate bill includes a mandatory exception to the English/civics requirement for individuals with disabilities and discretionary exception for those who are age 70 and older.
- ¹⁷ Profile of the Unauthorized Population: United States. Migration Policy Institute. 2014. <http://www.migrationpolicy.org/data/unauthorized-immigrant-population/state/US>
- ¹⁸ Empire Justice Center. *Public Benefit Eligibility of Deferred Action Dreamers*. September 2012. <http://www.empirejustice.org/issue-areas/immigrant-rights/access-to-public-benefits/public-benefit-eligibility-of.html>
- ¹⁹ *Comprehensive Immigration Reform: A Proposal for a Skills Strategy that Supports Economic Growth and Opportunity*. National Skills Coalition. June 2013. http://www.nationalskillscoalition.org/resources/publications/file/2013-6-24_NSC-CIR-Recommendations-Final.pdf

ABOUT NATIONAL SKILLS COALITION

National Skills Coalition is a non-partisan, broad-based coalition of employers, unions, education and training providers, and public officials working toward a vision of an America that grows its economy by investing in its people so that every worker and every industry has the skills to compete and prosper. We engage in organizing, advocacy, and communications to advance state and federal policies that support these goals — policies that are based on the on-the-ground expertise of our members.

National Skills Coalition was founded in 1998 as The Workforce Alliance in response to a series of federal policies that signaled the end of national investments in the skills of America's workers at a time when skill gaps were growing in key U.S. industries. Since then, we've demonstrated that investments in skills work. We've shown that diverse stakeholders can find agreement around specific reforms that will improve a variety of workforce education and training policies. And we have documented that the American public is strongly supportive of a deeper investment in the skills of America's workers. We continue to mobilize support for a new national skills agenda that cuts across public policies, and simultaneously serves a wide range of U.S. workers and industries.

National Skills Coalition is governed by a Board of Directors and advised by a national Leadership Council drawn from the ranks of business, labor, community colleges, community-based organizations, and the public workforce system.

More than 8,000 members, representing more than 3,000 organizations in all 50 states, comprise the broad-based membership of National Skills Coalition.

Learn more at www.nationalskillscoalition.org.



NATIONAL SKILLS COALITION
1730 Rhode Island Avenue NW
Suite 712
Washington DC 20036
Phone: 202.223.8991
Fax: 202.223.8354
info@nationalskillscoalition.org
www.nationalskillscoalition.org

EXHIBIT 27



REPORT TO THE PRESIDENT

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Executive Office of the President
President's Council of Advisors
on Science and Technology

FEBRUARY 2012





REPORT TO THE PRESIDENT
ENGAGE TO EXCEL: PRODUCING ONE MILLION
ADDITIONAL COLLEGE GRADUATES WITH
DEGREES IN SCIENCE, TECHNOLOGY,
ENGINEERING, AND MATHEMATICS

Executive Office of the President
President's Council of Advisors
on Science and Technology

FEBRUARY 2012



About the President's Council of Advisors on Science and Technology

The President's Council of Advisors on Science and Technology (PCAST) is an advisory group of the nation's leading scientists and engineers, appointed by the President to augment the science and technology advice available to him from inside the White House and from cabinet departments and other Federal agencies. PCAST is consulted about and often makes policy recommendations concerning the full range of issues where understandings from the domains of science, technology, and innovation bear potentially on the policy choices before the President.

For more information about PCAST, see www.whitehouse.gov/ostp/pcast.



The President's Council of Advisors on Science and Technology

Co-Chairs

John P. Holdren

Assistant to the President for
Science and Technology
Director, Office of Science and Technology Policy

Eric Lander

President
Broad Institute of Harvard and MIT

Vice Chairs

William Press

Raymer Professor in Computer Science and
Integrative Biology
University of Texas at Austin

Maxine Savitz

Vice President
National Academy of Engineering

Members

Rosina Bierbaum

Professor of Natural Resources and
Environmental Policy
School of Natural Resources and Environment
and School of Public Health
University of Michigan

Shirley Ann Jackson

President
Rensselaer Polytechnic Institute

Richard C. Levin

President
Yale University

Christine Cassel

President and CEO
American Board of Internal Medicine

Chad Mirkin

Rathmann Professor, Chemistry, Materials
Science and Engineering, Chemical and
Biological Engineering and Medicine
Director, International Institute for
Nanotechnology
Northwestern University

Christopher Chyba

Professor, Astrophysical Sciences and
International Affairs
Director, Program on Science and Global Security
Princeton University

Mario Molina

Professor, Chemistry and Biochemistry
University of California, San Diego
Professor, Center for Atmospheric Sciences at the
Scripps Institution of Oceanography
Director, Mario Molina Center for Energy and
Environment, Mexico City

S. James Gates, Jr.

John S. Toll Professor of Physics
Director, Center for String and Particle Theory
University of Maryland, College Park

Mark Gorenberg

Managing Director
Hummer Winblad Venture Partners

Ernest J. Moniz

Cecil and Ida Green Professor of Physics and
Engineering Systems
Director, MIT's Energy Initiative
Massachusetts Institute of Technology

Craig Mundie

Chief Research and Strategy Officer
Microsoft Corporation

Ed Penhoet

Director, Alta Partners
Professor Emeritus, Biochemistry and Public
Health
University of California, Berkeley

Barbara Schaal

Mary-Dell Chilton Distinguished Professor of
Biology
Washington University, St. Louis
Vice President, National Academy of Sciences

Eric Schmidt

Executive Chairman
Google, Inc.

Daniel Schrag

Sturgis Hooper Professor of Geology
Professor, Environmental Science and
Engineering
Director, Harvard University Center for the
Environment
Harvard University

David E. Shaw

Chief Scientist, D.E. Shaw Research
Senior Research Fellow, Center for
Computational Biology and Bioinformatics
Columbia University

Ahmed Zewail

Linus Pauling Professor of Chemistry and Physics
Director, Physical Biology Center
California Institute of Technology

Staff

Deborah Stine

Executive Director

Danielle Evers

AAAS Science and Technology Policy Fellow

Amber Hartman Scholz

Assistant Executive Director



EXECUTIVE OFFICE OF THE PRESIDENT
PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20502

President Barack Obama
The White House
Washington, D.C. 20502

Dear Mr. President,

We are pleased to present you with this report, *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics*, prepared for you by the President's Council of Advisors on Science and Technology (PCAST). This report provides a strategy for improving STEM education during the first two years of college that we believe is responsive to both the challenges and the opportunities that this crucial stage in the STEM education pathway presents.

In preparing this report, PCAST assembled a Working Group of experts in postsecondary STEM teaching, learning-science research, curriculum development, higher-education administration, faculty training, educational technology, and successful interaction between industry and higher education. The report was strengthened by input from additional experts in postsecondary STEM education, STEM practitioners, professional societies, private companies, educators, and Federal education officials.

PCAST found that economic forecasts point to a need for producing, over the next decade, approximately 1 million more college graduates in STEM fields than expected under current assumptions. Fewer than 40% of students who enter college intending to major in a STEM field complete a STEM degree. Merely increasing the retention of STEM majors from 40% to 50% would generate three-quarters of the targeted 1 million additional STEM degrees over the next decade.

PCAST identified five overarching recommendations that it believes can achieve this goal: (1) catalyze widespread adoption of empirically validated teaching practices; (2) advocate and provide support for replacing standard laboratory courses with discovery-based research courses; (3) launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap; (4) encourage partnerships among stakeholders to diversify pathways to STEM careers; and (5) create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.

Implementing these recommendations will help you achieve one of the key STEM goals you stated in your address to the National Academy of Sciences in April 2009: "American students will move from the middle to the top of the pack in science and math over the next decade. For we know that the nation that out-educates us today—will out-compete us tomorrow." The members of PCAST are grateful for the opportunity to provide our input on an issue of such critical importance to the Nation's future.

Sincerely,

A handwritten signature in blue ink that reads "John P. Holdren".

John P. Holdren
PCAST Co-Chair

A handwritten signature in blue ink that reads "Eric Lander".

Eric Lander
PCAST Co-Chair



Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics

Executive Report

Economic projections point to a need for approximately 1 million more STEM professionals than the U.S. will produce at the current rate over the next decade if the country is to retain its historical preeminence in science and technology. To meet this goal, the United States will need to increase the number of students who receive undergraduate STEM degrees by about 34% annually over current rates.

Currently the United States graduates about 300,000 bachelor and associate degrees in STEM fields annually. Fewer than 40% of students who enter college intending to major in a STEM field complete a STEM degree. Increasing the retention of STEM majors from 40% to 50% would, alone, generate three-quarters of the targeted 1 million additional STEM degrees over the next decade. Many of those who abandon STEM majors perform well in their introductory courses and would make valuable additions to the STEM workforce. Retaining more students in STEM majors is the lowest-cost, fastest policy option to providing the STEM professionals that the nation needs for economic and societal well-being, and will not require expanding the number or size of introductory courses, which are constrained by space and resources at many colleges and universities.

The reasons students give for abandoning STEM majors point to the retention strategies that are needed. For example, high-performing students frequently cite uninspiring introductory courses as a factor in their choice to switch majors. And low-performing students with a high interest and aptitude in STEM careers often have difficulty with the math required in introductory STEM courses with little help provided by their universities. Moreover, many students, and particularly members of groups underrepresented in STEM fields, cite an unwelcoming atmosphere from faculty in STEM courses as a reason for their departure.

Better teaching methods are needed by university faculty to make courses more inspiring, provide more help to students facing mathematical challenges, and to create an atmosphere of a community of STEM learners. Traditional teaching methods have trained many STEM professionals, including most of the current STEM workforce. But a large and growing body of research indicates that STEM education can be substantially improved through a diversification of teaching methods. These data show that evidence-based teaching methods are more effective in reaching all students—especially the “underrepresented majority”—the women and members of minority groups who now constitute approximately 70% of college students while being underrepresented among students who receive undergraduate STEM degrees (approximately 45%). This underrepresented majority is a large potential source of STEM professionals.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

The Need for an Improved STEM Student Recruitment and Retention Strategy for the First Two Years of Postsecondary Education

The first two years of college are the most critical to the retention and recruitment of STEM majors. These two years are also a shared feature of all types of 2- and 4-year colleges and universities—community colleges, comprehensive universities, liberal arts colleges, research universities, and minority-serving institutions. In addition, STEM courses during the first two years of college have an enormous effect on the knowledge, skills, and attitudes of future K-12 teachers. For these reasons, this report focuses on actions that will influence the quality of STEM education in the first two years of college.

Based on extensive research about students' choices, learning processes, and preparation, three imperatives underpin this report:

- Improve the first two years of STEM education in college.
- Provide all students with the tools to excel.
- Diversify pathways to STEM degrees.

Our recommendations, described below, detail how to convert these imperatives into action.

The title of this report, “Engage to Excel,” applies to students, faculty, and leaders in academia, industry, and government. Students must be engaged to excel in STEM fields. To excel as teachers, faculty must engage in methods of teaching grounded in research about why students excel and persist in college. Moreover, success depends on the engagement by great leadership. Leaders, including the President of the United States; college, university and business leadership; and others, must encourage and support the creation of well-aligned incentives for transforming and sustaining STEM learning. They also must encourage and support the establishment of broad-based reliable metrics to measure outcomes in an ongoing cycle of improvement.

Transforming STEM education in U.S. colleges and universities is a daunting challenge. The key barriers involve faculty awareness and performance, reward and incentive systems, and traditions in higher education. The recommendations in this report address the most significant barriers and use both tangible resources and persuasion to inspire and catalyze change. Attacking the issue from numerous angles and with various tools is aimed at reaching a point at which the movement will take on a momentum of its own and produce sweeping change that is sustainable without further Federal intervention.

Recommendations

The President’s Council of Advisors on Science and Technology (PCAST) proposes five overarching recommendations to transform undergraduate STEM education during the transition from high school to college and during the first two years of undergraduate STEM education:

- 1. Catalyze widespread adoption of empirically validated teaching practices.**
- 2. Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.**

EXECUTIVE REPORT

- 3. Launch a national experiment in postsecondary mathematics education to address the math preparation gap.**
- 4. Encourage partnerships among stakeholders to diversify pathways to STEM careers.**
- 5. Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.**

Each of these recommendations will be explained in more detail below.

Recommendation 1.

Catalyze widespread adoption of empirically validated teaching practices.

Learning theory, empirical evidence about how people learn, and assessment of outcomes in STEM classrooms all point to a need to improve teaching methods to enhance learning and student persistence. Classroom approaches that engage students in “active learning” improve retention of information and critical thinking skills, compared with a sole reliance on lecturing, and increase persistence of students in STEM majors. STEM faculty need to adopt teaching methods supported by evidence derived from experimental learning research as well as from learning assessment in STEM courses. Evidence-based teaching methods have proven effective with a wide range of class sizes and increase learning outcomes even as enhancements of traditional lectures.

A significant barrier to broad implementation of evidence-based teaching approaches is that most faculty lack experience using these methods and are unfamiliar with the vast body of research indicating their impact on learning. The Federal Government could have a major impact by providing substantial support for programs that provide training for current and future faculty in evidence-based teaching methods and provide materials to support the application of such methods. Established programs run by the National Academies and the American Physical Society (APS) have trained many faculty, and evaluations of these programs have demonstrated that they change the participants’ teaching methods and have positive effects on student achievement and engagement. These programs provide successful models for replication and expansion.

Although evidence-based teaching methods do not necessarily require more resources than traditional lectures, the transition requires time and effort that can be costly for colleges and universities. Given the Federal Government’s interest in maintaining a strong STEM workforce, Federal support, in partnership with private and academic institutional investment, will be needed to initiate these changes, after which they can be sustained over the long term without external assistance.

Ongoing change toward the goal described here requires the ability to measure progress. Metrics for excellence in undergraduate STEM education would provide tools for institutions, departments, funding agencies, external evaluators, accreditation agencies, students choosing where to study STEM subjects, and those designing innovative programs. Flexible criteria are needed to account for the wide range of institutions and disciplines that will use these tools to direct change.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Actions to achieve Recommendation 1.

1-1 Establish discipline-focused programs funded by Federal research agencies, academic institutions, disciplinary societies, and foundations to train current and future faculty in evidence-based teaching practices.

Successful programs should be expanded to reach 10% to 20% of the nation's 230,000 STEM faculty over the next five years. The expansion should make training available to faculty from diverse backgrounds to provide role models for all students and from all disciplines and types of institutions. Based on data from existing teaching training programs, it is reasonable to expect trained faculty to influence the teaching of 10 colleagues, making it possible to reach a substantial proportion of the STEM faculty through programs targeted at a subset of faculty. Moreover, approximately 10% of the STEM faculty teach the introductory courses to first- and second-year college students. Therefore, the goal of reaching 10% to 20% of the STEM faculty directly could result in training most of those who teach in the first two years of college.

A total of \$10-15 million per year over 5 years will be required for the training of 23,000 to 46,000 STEM faculty. Funds for this training should be derived from a combination of Federal programs academic institutions, disciplinary societies, and foundations. To train future faculty, Federal research agencies should require all graduate students and postdoctoral fellows supported by federal training grants to receive instruction in modern teaching methods. A combination of training grant and institutional funds should be dedicated to this training effort.

1-2 Create a "STEM Institutional Transformation Awards" competitive grants program at NSF.

A competitive grants program should be designed to provide incentives for and facilitate teaching innovations at 2- and 4-year institutions. Grants should support model programs and electronic dissemination of successful practices. The grants program should have funding of \$20 million per year, to support approximately 100 multi-year projects with average total support of \$1 million over a 5-year period. Funding could come from enactment of NSF's proposed Widening Implementation and Demonstration of Evidence-Based Reforms (WIDER) program at the Presidents' Fiscal Year 2012 requested level of \$20 million annually.

1-3 Request that the National Academies develop metrics to evaluate STEM education.

To evaluate progress toward the goals presented in this report, campuses, funders, students, and accreditation agencies need a meaningful set of criteria by which to measure excellence in STEM education. NSF and the U.S. Department of Education should request The National Academies to lead an effort to develop metrics supported by empirical evidence that encourage and assess faculty practices and student learning.

Recommendation 2.

Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.

Traditional introductory laboratory courses generally do not capture the creativity of STEM disciplines. They often involve repeating classical experiments to reproduce known results, rather than engaging

EXECUTIVE REPORT

students in experiments with the possibility of true discovery. Students may infer from such courses that STEM fields involve repeating what is known to have worked in the past rather than exploring the unknown. Engineering curricula in the first two years have long made use of design courses that engage student creativity. Recently, research courses in STEM subjects have been implemented at diverse institutions, including universities with large introductory course enrollments. These courses make individual ownership of projects and discovery feasible in a classroom setting, engaging students in authentic STEM experiences and enhancing learning and, therefore, they provide models for what should be more widely implemented.

Actions to achieve Recommendation 2.

2-1 Expand the use of scientific research and engineering design courses in the first two years through an NSF program.

The National Science Foundation should provide initial funding to replicate and scale-up model research or design courses, possibly through the existing Transforming Undergraduate Education in STEM (TUES) program or the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP). On the order of 30% of the existing programs across STEM disciplines could be focused on funding implementation of research courses at postsecondary academic institutions at an annual cost of approximately \$12.5 million dollars (based on Fiscal Year 2010 funding levels). Based on the range of funding for Type 3 TUES grants and Type 1 STEP grants, about 10 proposals per year at an average level of \$1.2 million could be awarded, in order to impact 100 campuses over the next 10 years.

Colleges and universities should seek to match NSF funding with private and philanthropic sources. Research courses should be an encouraged element of STEM Institutional Transformation Awards. Because research courses will replace expensive introductory laboratory courses, they should not require ongoing external support once the transition is accomplished.

2-2 Expand opportunities for student research and design in faculty research laboratories by reducing restrictions on Federal research funds and redefining a Department of Education program.

Independent research on faculty projects is a direct way for students to experience real discovery and innovation and to be inspired by STEM subjects. All relevant Federal agencies should examine their programs which support undergraduate research and where there exists prohibitions, either in policy or practice, which would interfere with the recommendations of this report to support early engagement of students in research, these should be changed. Federal agencies should encourage projects that establish collaborations between research universities and community colleges or other institutions that do not have research programs. Cross-institutional research opportunities could be funded through redefinition of the Department of Education's \$1 billion Carl D. Perkins Career and Technical Education program and by sharpening the focus of Federal investments in minority institutions.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Recommendation 3.

Launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap.

College-level skills in mathematics and, increasingly, computation are a gateway to other STEM fields. Today many students entering college lack these skills and need to learn them if they are to pursue STEM majors. In addition, employers in the private sector, government, and military frequently cite that they cannot find enough employees with needed levels of mathematics skills. This lack of preparation imposes a large burden on higher education and employers. Higher education alone spends at least \$2 billion per year on developmental education to compensate for deficiencies. Also, introductory mathematics courses often leave students with the impression that all STEM fields are dull and unimaginative, which has particularly harmful effects for students who later become K-12 teachers. Reducing or eliminating the mathematics-preparation gap is one of the most urgent challenges—and promising opportunities—in preparing the workforce of the 21st century.

Closing this gap will require coordinated action on many fronts starting in the earliest grades. PCAST's earlier report on K-12 STEM education, *Prepare and Inspire: K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future*, contains several recommendations that involve colleges and universities in this effort. In particular, it calls for the Federal Government to establish the objective of recruiting, preparing, and providing induction support for at least 100,000 new STEM middle and high school teachers who have majors in STEM fields and strong content-specific pedagogical preparation. This Administration has embraced this goal, and production of 1 million additional STEM graduates over the next decade could contribute substantially to meeting it.

The Federal Government has a critical role in supporting the development of a knowledge base to close the mathematics-preparation gap. For example, research into the best ways to teach math to older students so they can pursue STEM subjects in the first two years of college is badly needed. Some developmental mathematics courses have demonstrated effectiveness in increasing math proficiency among those not ready for college-level math and even in encouraging students intending to major in STEM subjects to persist to graduation and a STEM degree. Mathematics education research should explore the attributes of these successful classes and ways to disseminate best practices.

In the *Prepare and Inspire* report, PCAST also called for the creation of a mission-driven, Advanced Research Projects Agency for Education (ARPA-Ed) that would propel and support (1) the development of innovative technologies and technology platforms for learning, teaching, and assessment across all subjects and ages, and (2) the development of effective, integrated, whole-course materials for STEM education. Many of these advances would benefit not only K-12 education but also the developmental courses that many students need to pursue STEM fields during the first two years of college.

Actions to achieve Recommendation 3.

3-1 Support a national experiment in mathematics undergraduate education at NSF, the Department of Labor, and the Department of Education.

The National Science Foundation and the Departments of Labor and Education should support a multi-campus 5-year initiative aimed at developing new approaches to remove or reduce the mathematics bottleneck that is currently keeping many students from pursuing STEM majors.

EXECUTIVE REPORT

This national experiment should fund a variety of approaches, including (1) summer and other bridge programs for high school students entering college; (2) remedial courses for students in college, including approaches that rely on computer technology; (3) college mathematics teaching and curricula developed and taught by faculty from mathematics-intensive disciplines other than mathematics, including physics, engineering, and computer science; and (4) a new pipeline for producing K-12 mathematics teachers from undergraduate and graduate programs in mathematics-intensive fields other than mathematics. Diverse institutions should be included in the experiment to assess the impact of the intervention on various types of students and schools. Outcome evaluations should be designed as a collective effort by the participating campuses and funding agencies.

Approximately 200 experiments at an average level of \$500,000 should be funded at institutions across the country, at an annual cost of \$20 million per year for 5 years. As mathematics preparation issues vary across the postsecondary spectrum, a variety of sources will be needed to fund experiments at diverse institution types. Funds for these experiments could be derived from a combination of the Department of Education's proposed First in the World Initiative, possibly the Department of Labor's Career Pathways Innovation Fund or Trade Adjustment Assistance Community College and Career Training initiative, and a strategic focus on mathematics of NSF's Transforming Undergraduate Education in STEM (TUES) program or Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) for the next 5 years.

Recommendation 4.

Encourage partnerships among stakeholders to diversify pathways to STEM careers.

To take advantage of the breadth of available talent, non-traditional students should receive special attention. Adult and working students and those from backgrounds atypical of traditional STEM students may need alternative pathways to be successful in STEM disciplines. The concept of a "pipeline" to STEM competency and accomplishment needs to be superseded by the image of multiple pathways to these goals. All colleges and universities, including 2- and 4-year institutions, need better connections among themselves and with other institutions to provide more entry points and pathways to STEM degrees.

Actions to achieve Recommendation 4.

Establishing and supporting pathways will require a coordinated effort among diverse institutions. The Federal Government can lead this effort and encourage the necessary partnerships through strategic planning, reallocation of funds, and leadership.

4-1 Sponsor at the Department of Education summer STEM learning programs for high school students.

The Department of Education should roll-out the summer learning programs authorized in the 2007 America Competes Act (in an amendment introduced by then-Senator Obama) to provide mathematics instruction and hands-on STEM experiences for rising high school juniors and seniors. The programs should be funded by partnerships among the Federal Government, states, local entities, and private industry. Based on the size of National Science Foundation's

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

former Young Scholars Program for summer institutes, we recommend an investment of \$10 million to fund approximately 100 projects reaching on the order of 5000 students, annually, with significant cost sharing with academic institutions and private investors.

4-2 Encourage pathways from 2- to 4-year institutions through an NSF program and expanded definition of a Department of Labor Program.

The mission of the Department of Labor's Trade Adjustment Assistance Community College and Career Training initiative should be expanded beyond development of important partnerships between community and technical colleges and employers in the private sector to encourage scientific research and engineering design exchanges across two- and four-year institutions. Alternatively, these activities could be funded through a strategic focus of the Department of Labor's Career Pathways Innovation Fund on research partnerships. NSF's Advancing Technical Education program could also be focused on cross institutional collaborations. The bridges described here should provide authentic STEM experiences for community college students on the four-year campus and allow students to develop relations with faculty and the college or university community to ease the potential transition from a 2- to 4-year institution or to provide advanced experiences for students who do not pursue a four year degree.

4-3 Establish public-private partnerships to support successful STEM programs.

To enhance students' STEM readiness, the Federal Government should engage private industry and foundations to support successful programs that create bridges between high schools and colleges and between 2- and 4-year institutions and ensure that programs incorporate learning standards and content consistent with industry-recognized skills.

4-4 Improve data provided by the Department of Education and the Bureau of Labor Statistics to STEM students, parents, and the greater community on STEM disciplines and the labor market.

To promote pathways to STEM careers for non-traditional students, the Federal Government should provide current and comprehensive data on STEM jobs. Today, public and private employers of STEM professionals lack data about the skills, choices, and availability of STEM workers. To produce needed information, the 1988 cohort and the *High School and Beyond* cohort should be resurveyed; the Department of Education should devote more resources to tracking students from high school into their careers; and the Bureau of Labor Statistics should redefine employment categories to include in "STEM" the breadth of jobs that require STEM skills, such as medical careers and advanced manufacturing professions.

Recommendation 5.

Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.

The leadership of higher education and STEM-enabled businesses needs to be inspired to generate sweeping changes in higher education to produce the workforce America needs. Toward this end, we recommend that the President, via Executive Order, form a Presidential Council on STEM Education to

EXECUTIVE REPORT

provide advice and leadership on postsecondary STEM education. The council should include members that represent the breadth of academic institutions, professional societies, businesses, and private foundations involved in the development and use of human capital in STEM fields. Based on the guidance provided in this report, the council should make recommendations that advance the quality of postsecondary STEM education through all mechanisms available to the President. The council could provide a forum for leaders in the public and private sectors to weigh in on the development and deployment of metrics to evaluate STEM departments (Recommendation 1) and to design collaborative coalitions to support initiatives in STEM education (Recommendation 4), including expanding internship programs in industry and connecting industrial research agendas with research courses (Recommendation 2). In addition, it could provide advice and review for the National Experiment in Math Undergraduate Education (Recommendation 3) and could conduct further study of the math education issue, if necessary.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

**OVERVIEW OF PCAST RECOMMENDATIONS
TO ENGAGE AND EXCEL IN UNDERGRADUATE SCIENCE, TECHNOLOGY,
ENGINEERING, AND MATHEMATICS (STEM) EDUCATION**

Recommendation 1: Catalyze widespread adoption of empirically validated teaching practices.

- 1-1** Establish discipline-focused programs funded by Federal research agencies, academic institutions, disciplinary societies, and foundations to train current and future faculty in evidence-based teaching practices.
- 1-2** Create the “STEM Institutional Transformation Awards” competitive grants program at NSF.
- 1-3** Request that the National Academies develop metrics to evaluate STEM education.

Recommendation 2: Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.

- 2-1** Expand the use of scientific research and engineering design courses in the first two years of postsecondary education through an NSF program.
- 2-2** Expand opportunities for student research and design in faculty research laboratories by reducing restrictions on Federal research funds and redefining a Department of Education program.

Recommendation 3: Launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap.

- 3-1** Support a national experiment in mathematics undergraduate education at NSF, the Department of Labor, and the Department of Education.

Recommendation 4: Encourage partnerships among stakeholders to diversify pathways to STEM careers.

- 4-1** Sponsor at the Department of Education summer STEM learning programs for high school students.
- 4-2** Expand the scope of a Department of Labor Program and focus an NSF program to encourage pathways from 2-to 4-year institutions.
- 4-3** Establish public-private partnerships to support successful STEM programs.
- 4-4** Improve data provided by the Department of Education and the Bureau of Labor Statistics to STEM students, parents, and the greater community on STEM disciplines and the labor market.

Recommendation 5: Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.



The President's Council of Advisors on Science and Technology

*Engage to Excel: Producing One Million
Additional College Graduates with Degrees in Science,
Technology, Engineering, and Mathematics*

Working Group Report



PCAST STEM Undergraduate Education Working Group

Co-Chairs

S. James Gates, Jr.*

John S. Toll Professor of Physics
Director, Center for String and Particle Theory
University of Maryland, College Park

Jo Handelsman

Howard Hughes Medical Institute Professor and
Frederick Phineas Rose Professor, Molecular,
Cellular and Developmental Biology
Yale University

G. Peter Lepage

Professor of Physics
Harold Tanner Dean, College of Arts and Sciences
Cornell University

Chad Mirkin*

Rathmann Professor, Chemistry, Materials
Science and Engineering, Chemical and
Biological Engineering and Medicine
Director, International Institute for
Nanotechnology
Northwestern University

Working Group Members

Joseph G. Altonji

Thomas DeWitt Cuyler Professor of Economics
Yale University

Peter Bruns

Vice President for Grants and Special Programs
(Retired)
Howard Hughes Medical Institute (HHMI)

Carol Christ

President
Smith College

Isaac Crumbly

Associate Vice President for Career and
Collaborative Programs
Founder, Cooperative Development Energy
Program
Fort Valley State University

Emily DeRocco

President
The Manufacturing Institute
Senior Vice President
National Association of Manufacturers

Brian K. Fitzgerald

Chief Executive Officer
Business Higher Education Forum

Mark Gorenberg*

Managing Director
Hummer Winblad Venture Partners

Shirley Ann Jackson*

President
Rensselaer Polytechnic Institute

Neal Lane

Senior Fellow in Science and Technology Policy
James Baker Institute for Public Policy
Rice University

Tom Luce

Chief Executive Officer
National Math and Science Initiative

Judy Miner

President
Foothill College

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Suzanne Ortega

Senior Vice President for Academic Affairs
University of North Carolina

Ed Penhoet*

Director, Alta Partners
Professor Emeritus, Biochemistry and Public
Health
University of California, Berkeley

Calvin Phelps

National Chair
National Society of Black Engineers (NSBE)

Daniel Schrag*

Sturgis Hooper Professor of Geology
Professor, Environmental Science and
Engineering
Director, Harvard University Center for
Environment
Harvard University

Dan Schwartz

Professor
Stanford University School of Education

Candace Thille

Director of the Open Learning Initiative Carnegie
Mellon University

Staff

Danielle Evers

AAAS Science and Technology Policy Fellow

Deborah Stine

Executive Director

Writers

Steve Olson

Science Writer

Donna Gerardi Riordan

Science Writer and Policy Analyst

* PCAST member



Table of Contents

I. Introduction	1
II. Strategies: The First Two Years	5
III. Barriers and Challenges.	11
IV. A Multi-Faceted Approach: Reaching A Tipping Point.	15
Recommendations:	
1. Catalyze widespread adoption of empirically validated teaching practices	16
2. Advocate and provide support for replacing traditional lab courses with discovery-based research courses	25
3. Launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap	27
4. Encourage partnerships among stakeholders to diversify pathways to STEM careers	30
5. Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education	35
V. Engage to Excel: Summary of Recommendations, Actions, and Estimated Costs.	37
Appendix A: Experts Providing Input to PCAST	39
Appendix B: Acknowledgements	45
Appendix C: STEM Higher Education Enrollment, Persistence, and Completion Data	47
Appendix D: Economic Analysis of STEM Workforce Need	67
Appendix E: Evidence of the Mathematics-Preparation Gap	79
Appendix F: Efficacy of Various Classroom Methods	83
Appendix G: Review of Evidence that Research Experiences have Impacts on Retention	87
Appendix H: Effective Practices to Improve STEM Undergraduate Education	89
Appendix I: References for Tables 2, 3, 4	97



I. Introduction

Importance of STEM

Throughout the 20th century, science, technology, and higher education were drivers of innovation in the U.S. economy. The rapid expansion of the research and development enterprise after World War II—which was enabled by the growth of higher education and corresponding increases in the number of college graduates with expertise in science, technology, engineering, and mathematics (STEM)—led to strong economic performance, good jobs, and thriving new industries driven by new technologies.

The United States is now putting its future at risk by forfeiting its historical strengths in STEM education. The proportion of STEM degrees among all college graduates has been falling for the past decade.¹ Without action, it is likely that this proportion will continue to drop as groups that have historically earned fewer STEM degrees on average than white men become a larger majority of college students.²

As has occurred previously—with the 1862 Federal support for the establishment of land grant colleges, for example, and almost a century later with the response to the launch of Sputnik—the Nation has reached a decision point. The United States could renew its commitment to education—and especially STEM education—or it could risk creating a permanent economic gap among American workers at a time of dramatic demographic transition and enhanced global economic competition.

The need for STEM knowledge extends to all Americans. The products of science, technology, engineering, and mathematics play a substantial and growing role in the lives of all Americans. A democratic society in which large numbers of people are unfamiliar or uncomfortable with scientific and technological advances faces a great economic disadvantage in globalized competition. Achieving scientific and technological literacy among our citizenry is a complex topic that differs in important ways from the challenge of training STEM professionals and is beyond the scope of this report; we hope that this topic will become the focus of future study. Nevertheless, the actions we recommend, though not specifically targeted at achieving broad STEM literacy, will affect STEM literacy among the college-educated citizenry.

One million additional college graduates with STEM degrees

Several analyses point to the need to add to the American workforce over the next decade approximately 1 million more STEM professionals than the U.S. will produce at current rates.^{3,4,5} The exact projections vary somewhat depending on the job definitions and assumptions embodied in the models, but the

1. See Appendix C.

2. See Appendix D.

3. Lacey, T. A. and B. Wright. (2009). "Occupational employment projections to 2018." *Monthly Labor Review* 132(11):82-123.

4. See Appendix D.

5. Langdon, D., G. McKittrick, D. Beede, B. Khan, and M. Doms. (2011). "STEM: Good Jobs Now and for the Future." *ESA Issue Brief* #03-11. Washington, DC: U.S. Department of Commerce.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

studies produce results on the same order of magnitude. For example, one analysis by the Center on Education and the Workforce at Georgetown University shows that between 2008 and 2018, STEM occupations will increase from 5.0% of the jobs in the U.S to 5.3%, an increase that is equivalent to 1 million jobs⁶ and that 92% of STEM jobs by 2018 will require at least some postsecondary education and training.⁷ This projection also aligns with the President's goal of the United States regaining its lead in the world in the number of young people graduating from college. If the STEM fields are going to take part in this growth of college-educated Americans, the number of STEM degrees earned must increase by about 1 million over the next decade.

In the past, the United States has relied on foreign-born STEM professionals to satisfy unmet work-force demands, and these employees have made important contributions to the U.S. economy. But the U.S. is not guaranteed a continuing future supply of international workers in STEM fields because education and employment opportunities are increasing in numbers elsewhere. Reliance on foreign nationals makes our security and economy vulnerable as their home countries become more attractive and their STEM-trained workers return from the U.S. to serve the needs of their homelands. Moreover, STEM-related jobs are among the best our economy offers, as evidenced by their high wages and lower unemployment rates than in other sectors.^{8,9,10} The increased supply of jobs in these fields will offer an opportunity to reduce income inequality in the United States.^{11,12} This opportunity can be captured only by increasing the number of U.S.-born college graduates with training in STEM fields from all demographic sectors of U.S. society.

The U.S. currently graduates about 300,000 bachelor and associate degrees in STEM fields annually;¹³ thus, between 2012 and 2022, the U.S. can be expected to produce approximately 3 million STEM degrees. To meet the goal of an additional 1 million STEM college graduates in the next decade, we would need to graduate an additional 100,000 per year, representing an approximately 33% increase over current production rates. This goal is justified and will be feasible with strategic actions. (See Appendix D for a more extensive analysis of the need for 1 million additional STEM workers.)

6. Carnevale, A.P., N. Smith, and J. Strohl. (2010). *Help Wanted: Projections of Jobs and Education Requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.

7. Carnevale, A.P., N. Smith, and M. Melton. (2011). *STEM*. Washington, DC: Georgetown University Center on Education and the Workforce.

8. U.S. General Accounting Office. (2005). *Higher Education: Federal Science, Technology, Engineering, and Mathematics Programs and Related Trends*. Washington, DC.

9. Langdon, et al. (2011), op. cit.

10. Scott, J. and A. Balakrishnan. "STEM Workforce Trends, Projections, and Skills Assessments." Unpublished analysis for PCAST Working Group on Postsecondary STEM Education, May 9, 2011. Washington, DC: IDA Science and Technology Policy Institute.

11. Carnevale, A. P., and S. J. Rose. (2011). *The Undereducated American*. Washington, DC: Georgetown University Center on Education and the Workforce.

12. Goldin, C., and L.F. Katz. (2008). *The Race Between Education and Technology*. Cambridge, MA: Harvard University Press.

13. Radford, A.W., L. Berkner, S.D. Wheelless, and B. Shepherd. (2010). "Persistence and Attainment of 2003–04 Beginning Postsecondary Students: After 6 Years (NCES 2011-151)." U.S. Department of Education. Washington, DC: National Center for Education Statistics. Accessible at <http://nces.ed.gov/pubsearch>.

I. INTRODUCTION

Beyond STEM professionals

In this report, STEM professionals are defined as those with degrees in STEM areas who are trained and work as STEM practitioners. In addition to the need for more STEM professionals, there is also a national need for more workers with some STEM training. These “STEM-capable” workers are able to use knowledge and skills from STEM fields but work in areas that are traditionally considered non-STEM fields. The ranks of the STEM-capable workforce are expanding as this skill set comes to represent an increasingly valued commodity in many fields. For example, physicians, nurses, and other health workers and advanced manufacturing professionals generally are not categorized as “STEM professionals,” yet many of these jobs draw heavily on STEM knowledge and skills, and represent some of the most rapidly growing or wealth producing sectors of the U.S. economy. Another group that is not counted in economic projections as STEM professionals are K-12 teachers with strong STEM skills, whose shortage has become a national crisis. (See Appendix D for further description of STEM skills categories).

Since none of these substantial groups is counted among the needed STEM professionals in the economic projections we cite here, the size of the future workforce needing STEM training may substantially exceed the addition of the estimated 1 million STEM professionals. The recommendations we present should affect the college-educated population generally by increasing interest in and knowledge of STEM subjects among graduates of diverse fields, thereby broadening the impact of the recommended actions beyond STEM professionals.

Engage to Excel

The themes guiding this report have broad application to leaders, faculty, and students in academia, industry, and government.

The title of this report, “*Engage to Excel*,” applies to individuals across these groups. Students must be engaged to excel in STEM fields. To excel as teachers, faculty must engage in methods of teaching grounded in research about why students excel and persist in college. Moreover, success depends on the engagement by great leadership. Leaders, including the President of the United States, college, university and business leadership, and others, must encourage and support the creation of well-aligned incentives for transforming and sustaining STEM learning. They also must encourage and support the establishment of broad-based reliable metrics to measure outcomes in an ongoing cycle of improvement.



II. Strategies: The First Two Years

How to fill the need?

In the United States, fewer than 40% of the students who enter college with the intention of majoring in a STEM field complete a STEM degree. Most of the students who leave STEM fields switch to non-STEM majors after taking introductory science, math, and engineering courses.¹⁴ Many of the students who leave STEM majors are capable of the work, making the retention of students who express initial interest in STEM subjects an excellent group from which to draw some of the additional one million STEM graduates. Research on the exodus from STEM disciplines shows that many students who transfer out of STEM majors perform well, but they describe the teaching methods and atmosphere in introductory STEM classes as ineffective and uninspiring.^{15,16} Others do not perform well despite interest and aptitude and would benefit from alternative teaching methods, tutoring, or other experiences demonstrated to improve performance in STEM subjects. Merely increasing retention from 40% to 50% would translate to an additional 72,500 STEM degrees per year, comprising almost three-quarters of the 1 million additional STEM graduates needed over the next decade.

Although women and members of minority groups now constitute approximately 70% of college students, they are underrepresented among students receiving undergraduate degrees in STEM subjects (approximately 45 percent). These students are an “underrepresented majority” that must be part of the route to excellence.¹⁷ Members of this group leave STEM majors at higher rates than others and offer an expanding pool of untapped talent. Some campuses have shown that differences in performance and retention between traditional STEM majors and members of the underrepresented majority can be reduced substantially by several simple changes in campus or classroom practices (e.g., see Appendices F and G).^{18,19,20,21} The underrepresented majority is a large underutilized source of potential STEM professionals and deserves special attention.

The current system of STEM education has effectively trained many STEM workers, including most of the current STEM workforce. However, its longevity is not evidence that it cannot be improved or that this system will be successful with today’s student body. Indeed, extensive evidence points to a need to

14. See Appendix C.

15. Seymour, E. and N. M. Hewitt. (1997). *Talking about leaving*. Boulder, CO: Westview Press.

16. Brainard, S. and L. Carlin. (1998). “A six-year longitudinal study of undergraduate women in engineering and science.” *Journal of Engineering Education* 87(4):, 369-375.

17. The concept of the “underrepresented majority” has particularly been championed by Shirley Jackson, president of Rensselaer Polytechnic Institute. For example: Jackson, Shirley. (2004). “The Perfect Storm: A Weather Forecast.” Address to the annual meeting of the American Association for the Advancement of Science, Seattle, WA.

18. Felder, R. M., G.N. Felder, and E.J. Dietz. (1998). “A longitudinal study of engineering student performance and retention v. comparisons with traditionally-taught students.” *Journal of Engineering Education* 87(4): 469-480.

19. Walton, G. M. and G. L. Cohen. (2011). “A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students.” *Science* 331(6023): 1447-1451.

20. Nagda, B. A., S. R. Greggerman, J. Jonides, W. von Hippel, and J.S. Lerner. (1998). “Undergraduate student-faculty research partnerships affect student retention.” *The Review of Higher Education* 22: 55-72.

21. Ohland, M. W., C.E. Brawner, M.M. Camacho, R.A. Layton, R.A. Long, S.M. Lord, and M.H. Wasburn. (2011). “Race, gender, and measures of success in engineering education.” *Journal of Engineering Education* 100: 225-252.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

do better. STEM disciplines have substantially lower rates of retention than do the social sciences and humanities.^{22,23,24} Furthermore, many of those who leave STEM majors express dissatisfaction with the teaching of STEM classes.^{25,26} This should be seen as a national crisis of STEM teaching, yet many STEM faculty members believe that this “weeding out” process is in the best interest of their disciplines and the larger national interest. If many of those who leave performed well in introductory STEM courses, and many others could be helped to succeed, then it is unreasonable to conclude that this attrition represents an effective selection process that is maximally beneficial to STEM fields.²⁷

The first two years of college are the most critical to retention and recruitment of STEM majors. The STEM courses in these years are also a shared feature of all types of 2- and 4-year colleges and universities—community colleges, comprehensive universities, liberal arts colleges, research universities, and minority-serving institutions. In addition, STEM courses in the first two years are all the STEM courses that most future K-12 teachers are going to experience in college. The amount they learn, the models of STEM teaching, and their attitudes towards STEM disciplines will have an enormous impact on their future teaching. For all these reasons, a focus on improving STEM courses taken early in college offers potentially enormous benefits to STEM fields. Therefore, this report focuses on actions that will influence the quality of STEM education in the first two years of college.

Persistence of students in STEM majors

Research indicates that student persistence in a STEM degree is associated primarily with three aspects of their experience. The first concerns *intellectual engagement and achievement*. Compared with students in traditional lectures, students who play an active role in the pursuit of scientific knowledge learn more and develop more confidence in their abilities, thereby increasing their persistence in STEM majors. This engagement can be accomplished in both the classroom and research lab. Many types of classroom instruction that engage students in thinking or problem-solving increase learning and enhance attitudes toward STEM fields. These gains translate into better retention of students in STEM majors. For example, students in traditional lecture courses were twice as likely to leave engineering and three times as likely to drop out of college entirely compared with students taught using techniques that engaged them actively in class.²⁸ In a randomized trial at the University of Michigan, students who engaged in sophomore research with a professor were much less likely to leave STEM majors than those who did not. The effects were observed among all groups, including white, African American, and Hispanic students.²⁹

22. The National Academies (2010). *Expanding Minority Participation: America's Science and Technology Talent at the Crossroads*. Washington, DC: National Academy Press.

23. See Appendix C.

24. Tobias, S. (1990). *They're Not Dumb, They're Different: Stalking the Second Tier*. Tucson, AZ: Research Corporation.

25. Seymour and Hewitt. (1997). *op. cit.*

26. Tobias. (1990). *op. cit.*

27. Sevo, R. (2009). “The Talent Crisis in Science and Engineering.” In B. Bogue & E. Cady (Eds.). *Applying Research to Practice (ARP) Resources*. Accessible at <http://www.engr.psu.edu/AWE/ARPResources.aspx>.

28. Felder, R. M., G.N. Felder, and E.J. Dietz. (1998). “A longitudinal study of engineering student performance and retention v. comparisons with traditionally-taught students.” *Journal of Engineering Education* 87(4): 469–480.

29. Nagda, B. A., S. R. Gregerman, J. Jonides, W. von Hippel, and J.S. Lerner. (1998). “Undergraduate student-faculty research partnerships affect student retention.” *The Review of Higher Education* 22: 55–72.

II. STRATEGIES: THE FIRST TWO YEARS

The second aspect of a student's experience that affects persistence is *motivation*. Motivation is partially intrinsic but also is modulated by the college environment. A key in maintaining student motivation is having role models. The majority of U.S. STEM faculty are white, male, able-bodied, and middle class and have had many role models with whom to identify. Role models who are women and ethnic minorities increase the performance and retention of students in those same groups.^{30,31,32} Financial concerns,³³ lack of encouragement from family members,³⁴ and a deficit of peers from similar backgrounds can erode self-confidence and the will to remain in STEM majors.³⁵

A student's belief about barriers or pathways to success in an academic field also influences motivation. For example, students who believe that hard work is the key element in success are more likely to interpret negative feedback as guidance for improvement, whereas students who believe that intrinsic ability determines a person's success are more likely to take negative feedback as a negative assessment of their ability to perform.³⁶ Courses that have very low average grades on exams can differentially discourage the latter group of students from continuing in STEM majors.³⁷

Some simple experiences have been shown to have large effects on performance and persistence. In one study, female subjects instructed to focus on the similarities between men and women performed better on a math exam and expressed less preference for typically feminine careers than students who received instructions that were not directed at gender.³⁸ A dramatic effect was achieved in performance on physics exams by having students write for 15 minutes about their values. This exercise only affected the women, thereby closing a rather substantial achievement gap between men and women in the class.³⁹ A recent paper reported a study of students who experienced a one-time intervention in which they were asked to read a short article about adversity in college and then write an essay and speak about it. Over a 3-year period, the African American students who experienced the intervention had grade point averages a full grade higher than those who did not experience the session, had fewer health problems, and had a greater sense of well-being than African American students in the control

30. Marx, D. M. and J. S. Roman. (2002). "Female Role Models: Protecting Women's Math Test Performance." *Personality and Social Psychology Bulletin* 28: 1183-1193.

31. Lockwood, P. (2006). "Someone like me can be successful: Do college students need same-gender role models?" *Psychology of Women Quarterly* 30(1): 36-46.

32. Cheryan, S., J.O. Siy, M. Vichayapai, B.J. Drury and S. Kim. (2011). "Do Female and Male Role Models Who Embody STEM Stereotypes Hinder Women's Anticipated Success in STEM?" *Social Psychological and Personality Science* 2: 656-664.

33. The National Academies. (2010). op. cit.

34. Sy, S. R. and J. Romero. (2008). "Family Responsibilities Among Latina College Students From Immigrant Families." *Journal of Hispanic Higher Education* 7(3): 212-227.

35. Ethier, K. A. and K. Deaux. (1994). "Negotiating Social Identity When Contexts Change—Maintaining Identification And Responding To Threat." *Journal of Personality and Social Psychology* 67: 243-251.

36. Aronson, J. M. (Ed.) (2002). *Improving academic achievement: Impact of psychological factors in education*. San Diego, CA: Academic Press.

37. Byars-Winston, A., Y. Estrada, C. Howard, D. Davis, J. Zalapa. (2010). "Influence of social cognitive and ethnic variables on academic goals of underrepresented students in science and engineering: A multiple-groups analysis." *Journal of Counseling Psychology* 57: 205-218.

38. Rosenthal, H.E. and R.J. Crisp. (2006). "Reducing stereotype threat by blurring intergroup boundaries." *Personality and Social Psychology Bulletin* 32, 501-511.

39. Kost-Smith, L. E., S.J. Pollock, N.S. Finkelstein, G.L. Cohen, T.A. Ito, and A. Miyake. (2011). "Replicating a Self-Affirmation Intervention to Address Gender Differences: Successes and Challenges." Research paper. Boulder, CO: Physics Education Research @ Colorado.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

group.⁴⁰ In addition, many studies show that participation in research improves motivation and active participation in subsequent courses for all students.⁴¹

The third aspect of a student's experience that affects persistence is *identification with a STEM field*. Recent work suggests that identification with a group or community of STEM professionals may overshadow many other factors in determining persistence.^{42,43,44} Developing meaningful relationships with peers and instructors, involvement in study groups, and participation in a research laboratory all are associated with reduced departures from STEM fields.^{45,46,47,48,49,50,51,52,53,54} Interventions to enhance minority students' identification with a field equalize retention between minority and majority students,⁵⁵ indicating the need for more focused programs that emphasize student engagement as part of a STEM community.

Strategies to achieve engagement and excellence in STEM learning

All three of the aspects of student experience discussed above must be addressed to increase retention among STEM students. The key strategies that we propose in this report fall into three broad categories:

- 1. Adopt STEM teaching strategies that emphasize student engagement.** The lecture has been a mainstay of higher education since the word "lecture" was created in the 14th century, and today most introductory STEM courses are taught largely through lectures. Extensive

40. Walton, G. M. and G. L. Cohen (2011). "A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students." *Science* 331(6023): 1447-1451.

41. Lopatto, D. (2007). "Undergraduate research experiences support science career decisions and active learning." *CBE Life Sciences Education* 6: 297-306.

42. Bartlett, K. (2003). "Towards a true community of scholars: undergraduate research in the modern university." *Journal of Molecular Structure: THEOCHEM* 666-667: 707-711.

43. Espinosa, L. L. (2011). "Pipelines and Pathways: Women of Color in Undergraduate STEM Majors and the College Experiences That Contribute to Persistence." *Harvard Educational Review* 81(2): 209-240.

44. Estrada, M., A. Woodcock, P.R. Hernandez, and P. Schultz, and P.W. Schultz. (2011). "Toward a model of social influence that explains minority student integration into the scientific community." *Journal of Educational Psychology* 103(1): 206-222.

45. Anaya, G. (2001). "Correlates of performance on the MCAT: an examination of the influence of college environments and experiences on student learning." *Advances in Health Sciences Education Theory and Practice* 6: 179-191.

46. Gregerman, S. R. (1999). "Improving the Academic Success of Diverse Students Through Undergraduate Research." *Council on Undergraduate Research Quarterly*.

47. Hathaway, R., B.A. Nagda, and S. Gregerman. (2002). "The relationship of undergraduate research participation to graduate and professional education pursuit: An empirical study." *Journal of College Student Development* 43(5): 614-631.

48. Bartlett. (2003). op. cit.

49. Kight, S.L., J.J. Gaynor, and S.D. Adams. (2006). "Undergraduate Research Communities: A Powerful Approach to Research Training." *Journal of College Science Teaching* July/August, 34-39.

50. Kinkel, D. H. and S. E. Henke (2006). "Impact of undergraduate research on academic performance, educational planning, and career development." *Journal of Natural Resources and Life Sciences Education* 35: 194-201.

51. Hunter, A-B., S. L. Laursen, and E. Seymour. (2007). "Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development." *Science Education* 91: 36-74.

52. Russell, S. H., M.P. Hancock, and J. McCullough. (2007). "The pipeline: Benefits of undergraduate research experiences." *Science* 316: 548-549.

53. Junge, B., C. Quiñones, J. Kakietek, D. Teodorescu, and P. Marsteller. (2010). "Promoting Undergraduate Interest, Preparedness, and Professional Pursuit in the Sciences: An Outcomes Evaluation of the SURE Program at Emory University." *CBE-Life Sciences Education* 9(2): 119-132.

54. Espinosa. (2011). op. cit.

55. The National Academies. (2010). op. cit.

II. STRATEGIES: THE FIRST TWO YEARS

research on how the human brain learns indicates that diversifying teaching methods enhances critical thinking skills, long-term retention of information, and student retention in STEM majors.^{56,57,58,59,60,61,62,63,64} Moreover, these active learning techniques benefit *all* students and can close the achievement gap between ethnic groups and men and women. We therefore recommend that STEM faculty learn how to use and incorporate highly effective teaching methods into their introductory STEM courses, including the opportunity to generate knowledge through research. These methods should include research courses, other forms of active student engagement, and learning assessment as part of a continued cycle of improvement in STEM education.

2. Provide all students with the tools to excel. Many students arrive in college without sufficient study skills, math proficiency, or identification as a scientist, engineer, or mathematician. These three contributors to success in STEM disciplines also are distributed differentially among ethnic and socioeconomic groups as well as between men and women. These are key foci for change that will reduce the achievement gap and increase retention of students in STEM courses. We therefore recommend high school to college bridge programs and other mechanisms to improve study skills, identification with STEM fields, and particularly math preparation. The POSSE foundation⁶⁵ provides a model from which key features can be used as a gold standard for bridge programs:

- A rigorous selection process for students with academic excellence, leadership potential, and interest in STEM fields.
- Enrichment programs and cohort events to build community and a support network for students
- Academic programs during the summer after high school to enable college readiness
- Mentoring, advising, and tutoring at college, including assistance finding a research laboratory

3. Diversify pathways to STEM degrees. There was a time when most people who attended college were single white men, had high school diplomas, started college at age 18, graduated

56. Conway, M. A. and S. J. Anderson. (1994). "The formation of flashbulb memories." *Memory & Cognition* 22: 326.

57. Weigel, R. H. (1975). "The impact of cooperative learning experiences on cross-ethnic relations and attitudes." *Journal of Social Issues* 31: 219-244.

58. Schwartz, D. L. and J.D. Bransford (1998). "A time for telling." *Cognition & Instruction* 16: 475-522.

59. Springer, L., M. E. Stanne, and S.S. Donovan. (1999). "Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis." *Review of Educational Research* 69(1): 21-51.

60. Rivard, L. P. and S. B. Straw. (2000). "The effect of talk and writing on learning science: An exploratory study." *Science Education* 84: 566-593.

61. Callender, A. A. and M. A. McDaniel. (2007). "The Benefits of Embedded Question Adjuncts for Low and High Structure Builders." *Journal of Educational Psychology* 99: 339-348.

62. Chen, J. Y. (2011). "Problem-based learning: Developing resilience in nursing students." *Kaohsiung Journal of Medical Sciences* 27(6): 230-233.

63. Morgan, R. L., J. E. Whorton, and C. Gunsalas. (2000). "A comparison of short term and long term retention: lecture combined with discussion versus cooperative learning." *Journal of Instructional Psychology* 27: 53-58.

64. National Research Council. (2005). *How Students Learn: Science in the Classroom*. Washington, DC: National Academy Press.

65. See The Posse Foundation: <http://www.possefoundation.org/>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

in 4 years, had all the academic preparation needed to succeed, and had few family responsibilities. In the 21st century, this is not true. Today, students come from diverse backgrounds, have widely divergent levels of preparation, may be returning to college after years in the workforce or serving in the U.S. military, and often are employed while in college to support themselves and families. Higher education needs to acknowledge these differences among students and work to accommodate them by creating more entry points and pathways to STEM degrees. At the beginning of the 21st Century, the concept of a “pipeline” to STEM competency and accomplishment needs to be replaced by a system of multiple pathways to these goals.



III. Barriers and Challenges

Institutional and individual barriers demand a multifaceted approach to catalyzing change

The strategies introduced in the previous section have the potential to transform undergraduate STEM education, but change in academia is slow and hard. The status quo is favored for many reasons, such as existing incentive structures and traditional practices. In this chapter of the report, we describe the most significant barriers to implementing the three strategies to achieve excellence and engagement. The next chapter presents a multifaceted set of actions that the Federal Government can take to encourage change and reduce or circumvent the barriers.

Faculty lack knowledge of evidence-based teaching

Despite what is a now vast body of research about how people learn and which teaching methods are most effective at transmitting knowledge and building critical thinking skills, most STEM faculty members have neither the time nor the incentives to find, read, and evaluate the literature or the teaching methods derived from it. Most teach using methods by which they were taught. Access to and implementation of modern assessment of learning is similarly distant from and inaccessible to the typical faculty member. Few opportunities for formal training in STEM teaching and assessment exist, and those that do are hard to find.

Lack of facilitation and rewards for good teaching

Instituting more effective institutional approaches than lecturing will require convincing a large segment of those teaching STEM courses that they can teach more effectively while still meeting all of their professional obligations (including teaching multiple courses, conducting research, and serving their institutions and disciplines). Today, faculty members still face several major obstacles to changing their teaching practices:

- Insufficient time to acquire the latest information on the most effective evidence-based teaching practices,
- lack of individual rewards for teaching, even at liberal arts colleges, where salaries and advancement more closely correlate with publication rate than teaching quality,
- lack of departmental rewards and expectations for good teaching.

The current incentive system for most STEM faculty is focused on research and not teaching. It therefore discourages the expenditures of time and effort required to surmount the obstacles cited above. As things stand, it seems untenable to expect faculty to become proficient practitioners of a research field as well as experts on the literature on effective evidence-based teaching practices. They need to be provided with tools and information that they can readily use in their teaching.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

To increase recognition of the importance of teaching in research institutions, it will be critical to have leadership from presidents and provosts to galvanize faculty through resources and rewards. Department chairs are critical to that effort because they have the most direct impact on teaching in STEM departments. Some of the changes are easy and inexpensive. For example, a department's web-page might simply provide a set of learning goals for students in their major; the process of agreeing on these learning goals would immediately elevate the visibility and importance of teaching and likely improve it as well. A department's website might also list faculty members who are outstanding teachers and provide evidence for their excellence. Some changes will be harder. Adding a requirement for teaching excellence to tenure guidelines has been accomplished at many research universities,^{66,67} but will be highly controversial at others. Some changes will require new resources. Revamping courses and curricula is difficult and requires time that must be subsidized. Resources can be used to influence how faculty spend their time and will be essential to seed transformation and institutionalization of improved STEM teaching.

Limited resources

Most universities have felt the economic realities of the last few years. Some struggle to provide the most basic elements of their curricula, so the idea of putting time and resources into new teaching approaches and programs may seem unrealistic. Leadership will need to address this issue through reallocation of existing resources, strategic fundraising, and securing financial assistance from private funders and State and Federal grants. However, the strategies proposed here require little expansion of the introductory courses. Increasing retention of students *beyond* the introductory courses will generate most of the new STEM majors.

Grading and workload across majors

Some students avoid or abandon STEM majors because they believe that their GPAs are likely to be lower in STEM courses than in humanities, business and management, or social sciences and that the workload is greater. They are correct at most universities. However, faculty can make it known that they are available to help students learn to ensure that they do as well as possible in their courses. STEM faculty also can make their courses so engaging that students will be inspired by STEM fields and persist in STEM majors despite the workload. Most students who intend to major in a STEM field have an intrinsic interest in STEM subjects that can compensate for the differences between STEM and other courses. Arbitrary depression of grading scales in STEM courses should be discontinued. These practices artificially reward students for majoring in non-STEM disciplines, especially for students who feel pressure from financial aid, GPA requirements, or graduate school admissions.

66. Anderson W.A., U. Banerjee, C.L.Drennan, S.C. Elgin, I.R. Epstein, J. Handelsman, G.F. Hatfull, R. Losick, D.K. O'Dowd, B.M. Olivera, S.A. Strobel, G.C. Walker, and I.M. Warner. (2011). "Science education. Changing the culture of science education at research universities." *Science* 331(6014):152-3.

67. See, for example, University of Wisconsin-Madison website for the Secretary of the Faculty: <http://www.secfac.wisc.edu>.

III. BARRIERS AND CHALLENGES

Institutional isolation

Many two-year and non-research institutions do not have the programs or resources to offer students a full suite of research opportunities. Addressing this will require collaborations among academic institutions as well as between academia and industry to expand the opportunities for students beyond their own institution.

Challenge of change

People are usually resistant to change. One reason that many faculty may maintain traditional teaching practices is that they have been successful in their fields and therefore assume that the educational approaches that taught them so effectively are appropriate for all students. But resistance to change is human and has been confronted successfully in numerous other settings. The study of individual, organizational, and cultural change is a sophisticated field that can inform the design of transformation strategies for STEM education in the first two years of college.

The fact that lecturing remains the overwhelmingly predominant form of instruction at the post-secondary level when there are hundreds of papers showing better ways to teach indicates that more than inertia is at work. The incentives for both the academic department and the individual faculty member at research universities are focused on maximizing research success, and this system has worked extremely well to maintain a powerful research engine in higher education. However, there are few, if any, counter-balancing incentives linked to desired educational outcomes, and there are often disincentives. One that exerts an overwhelming influence on junior faculty is the current tenure decision system. Though increased attention is now being paid to teaching effectiveness, tenure decision processes still push mainly in the opposite direction. Even if junior faculty come to an institution with the passion and determination to achieve teaching excellence, they can easily feel, and are often advised by their more senior colleagues, that teaching innovations should wait until after they have achieved tenure.

Effective incentives require good metrics for measuring accomplishment—metrics by which departments and individual faculty members can be compared and held accountable. Although research will always be the hallmark of the research university and must be valued and rewarded, the ideal faculty incentive system is based on both teaching and research accomplishments. For the incentive system to be meaningful, metrics for teaching quality must be credible.

To achieve the goals presented in this report, colleges and universities need to change their institutional and reward structures. In the last few decades, some extraordinary, sweeping changes have been deliberately instigated and studied in other societal areas. For example, the nearly universal familiarity in the United States with the idea of a “designated driver,” previously unknown in our society, was achieved in three years because of one person’s vision and action. Such campaigns provide guidance for designing similarly transformative initiatives.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table 1. Actions to induce cultural change

- | | |
|---|---|
| • Create a sense of urgency | • Reward change |
| • Identify credible guiding teams | • Ensure repeated exposure to message |
| • Create vision | • Provide checklists to measure progress |
| • Communicate vision and progress | • Create community for transformation leaders |
| • Facilitate change/remove obstacles | • Use diverse, concerted drivers to generate a tipping point |
| • Generate belief in successful movement | |

Sources:

Gladwell, M. (2002). *The Tipping Point: How Little Things Can Make a Big Difference*. New York, NY: Little, Brown & Co.;

Heath, C. and D. Heath (2010). *Switch*. New York, NY: Broadway Books.

Kotter, J. (1996). *Leading Change*. Boston, MA: Harvard Business Review Press.

Shapiro, A. (2003). *Creating Contagious Commitment: Applying the Tipping Point to Organizational Change*. Hillsborough, NC: Strategy Perspective.

Based on the theory and practice of cultural change, a number of steps must be accomplished to effect lasting change for STEM education (Table 1). Key elements to be addressed include human tendencies such as resistance to change, complacency, and cynicism; practical obstacles such as lack of resources and know-how; communication challenges including lack of awareness of the problem or successful solutions; and lack of reinforcements to foster change among individuals and institutions. The recommendations we make in the next chapter are focused on addressing the challenges, generating an environment, and establishing processes that will induce and sustain transformative change.



IV. A Multi-Facted Approach: Reaching the Tipping Point

No single strategy will generate 1 million additional undergraduate STEM degrees over the next decade, because the challenge has many dimensions. It entwines facts and logic with academic culture, incentives, and belief systems. Therefore the recommendations presented here address various stakeholders and use both tangible resources and persuasion to inspire and catalyze change in undergraduate STEM education. By attacking the issue from a number of angles with various tools, including public exhortation, faculty incentives, resources, information, and institutional connections, the concerted forces can reach a point at which the movement takes on a momentum of its own and leads to sweeping change.

Barriers to change vary with institution type and context. Some institutions may respond to a desire to be on the cutting edge of education, some to new resources, and others to the desire to maintain funding for and prestige of their graduate programs. Some faculty will be interested in change but will not know how to accomplish it; others will be waiting to hear from their administrations that this change is important and will be rewarded. Some students might benefit most from engaging in research, while others might be more in need of bolstering their math skills. Therefore, we propose promoting change with actions that address diverse students, faculty, departments, institutional leadership, industrial interests, and professional societies.⁶⁸ Our recommendations aim to overcome many barriers, from lack of faculty time for studying the education literature to the inability of students to re-enter college after they take a break from their education.

A number of steps must be accomplished to effect lasting change. Needed elements include a combination of rational thinking, a sense of urgency, community facilitation, cooperative action among key players, individual and group rewards, and visible success stories.

When the point is reached where ongoing change no longer depends on interventions by the Federal Government, the importance of engagement and excellence in STEM education will be part of the academic lexicon on every institution's agenda, and will be widely accepted as beneficial to students, faculty, and society. When this point is reached, resources for the recommendations below will be incorporated into the base budgets of many institutions, graduate students will not remember a time when science was taught by lectures alone, and having metrics to evaluate excellence in STEM education will be routine.

68. Kezar, A. J. and P. D. Eckel. (2002). "The Effect of Institutional Culture on Change Strategies in Higher Education: Universal Principles or Culturally Responsive Concepts?" *Journal of Higher Education* 73(4): 435-460.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Recommendations

The President's Council of Advisors on Science and Technology (PCAST) proposes five overarching recommendations to transform undergraduate STEM education during the transition from high school to college, and during the first two years of undergraduate STEM education:

1. **Catalyze widespread adoption of empirically validated teaching practices.**
2. **Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.**
3. **Launch a national experiment in postsecondary mathematics education to address the mathematics preparation gap.**
4. **Encourage partnerships among stakeholders to diversify pathways to STEM careers.**
5. **Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.**

Each of these recommendations will be explained in more detail below.

Recommendation I.

Catalyze widespread adoption of empirically validated teaching practices.

Rationale for Recommendation 1.

Evidence-Based Teaching

Thinking like a STEM professional requires acquisition of information, habits of mind, skills, and an identity embedded in a STEM discipline.⁶⁹ Such diverse attributes are unlikely to be learned most effectively through one mode of teaching. Yet most introductory STEM courses taken in the first two years of college are dominated by lectures and multiple choice tests. A substantial empirical literature has demonstrated that alternative models of instruction can achieve many important learning outcomes more effectively than current practice (Table 2). (For a discussion of the learning literature, see Appendix F.) STEM educators can take a more scientific approach to teaching by basing classroom choices on research evidence rather than habits and traditions.

"Evidence-based" teaching, also known as "scientific teaching,"⁷⁰ has two features. First, it involves choosing teaching methods based on research about how people learn and on proven teaching methods. Second, it involves using assessment of learning to determine whether students are meeting stated learning goals. Generally, approaches that most effectively transmit information and build critical thinking skills require that students are actively engaged in the process of and receive feedback while learning.⁷¹

69. National Research Council. (2005). *How Students Learn: Science in the Classroom*. Washington, DC: National Academy Press.

70. J. Handelsman, et al. D. Ebert-May, R. Beichner, P. Bruns, A. Chang, R. DeHaan, J. Gentile, S. Lauffer, J. Stewart, S. Tilghman, W. Wood. (2004). "Scientific Teaching." *Science* 304(5670), 521–522.

71. Ausubel, D. P. (2000). *The Acquisition and Retention of Knowledge: A Cognitive View*. Dordrecht, The Netherlands: Kluwer Academic Publishers.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

Table 2. Types of active learning that have been demonstrated to enhance learning.

Types of active learning with feedback	Examples of studies that demonstrate enhanced learning
Small group discussion and peer instruction	Anderson et al. (2005); Armbruster et al. (2009); Armstrong et al. (2007); Beichner et al. (1999); Born et al. (2002); Crouch and Mazur (2001); Fagen (2002); Lasry et al. (2008); Lewis and Lewis (2005); McDaniel (2007a, 2007b); Rivard and Straw (2000); Tessier (2004 and 2007); Tien et al. (2002)
Testing	Steele (2003)
One-minute papers	Almer et al. (1998); Chizmar and Ostrosky (1998); Rivard and Straw (2000)
Clickers	Smith et al. (2009, 2011)
Problem-based learning	Capon and Kuhn (2004); Preszler et al. (2007)
Case Studies	Preszler (2009)
Analytical challenge before lecture	Schwartz and Bransford (1998)
Group tests	Cortright et al. (2003); Klappa (2009)
Problem sets in groups	Cortright et al. (2005)
Concept mapping	Foncesca et al. (2004); Prezler (2004); Yarden et al. (2004)
Writing with peer review	Pelaez (2002)
Computer simulations and games	Harris et al. (2009); McDaniel et al. (2007); Traver et al. (2001)
Combination of active learning methods	Freeman et al. (2007); O'Sullivan and Cooper (2003)

Note: All studies cited compare treatment and control groups. Full references are found in Appendix I.

Classroom approaches that engage students actively have been shown to increase retention of information, build critical thinking skills, induce more positive attitudes toward STEM disciplines, and increase retention of students in STEM majors.^{72,73} Diverse methods that engage students in “active learning” have been successfully implemented in a large range of classroom sizes and can be done with an *increase*, not a decrease, in coverage of content. Most surprisingly to many instructors is the increase in retention of information, deep understanding, and student attendance and enthusiasm in class that result from a diversification of teaching approaches beyond lectures (see Table 2 for references).

Three types of research studies demonstrate the effects of evidence-based teaching methods on learning and retention in STEM degrees.

72. Peckham, J., P. Stephenson, J-Y Hervé, R. Hutt, and Miguel Encarnação. (2007). “Increasing student retention in computer science through research programs for undergraduates.” *SIGCSE '07: Proceedings of the 38th SIGCSE Technical Symposium on Computer Science Education* 39(1): 124–128.

73. McClanahan, E. B. and L. L. McClanahan. (2002). “Active Learning in a Non-Majors Biology Class.” *College Teaching* 50: 92-96.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

The field of cognitive psychology has constructed a substantial literature of randomized trials with carefully controlled variables in which different types of teaching are used and learning is measured with a single instrument. These studies consistently show that learning and retention of knowledge as well as acquisition of higher order thinking and reasoning skills are better with many types of active learning than lectures alone.^{74,75}

- Designed experiments that compare learning between two STEM courses in which the material is presented with active or passive (largely traditional) means show that the introduction of active learning into STEM courses of all sizes and disciplines induces more learning than lectures alone.^{76,77,78} In some of these experiments the instructor is the same in both classes, and in some the instructors differ.
- Retrospective analyses of student performance in courses or curricula, which resemble epidemiological studies in human health, also demonstrate more learning with active than passive methods.⁷⁹

While each of these lines of evidence has limitations, together they create a compelling body of research indicating that student learning can be enhanced by any of a large number of interventions that induce active engagement of students in the course material. A more extensive discussion of this research, a summary of more than 100 papers in the field, and a discussion of the experimental approaches used to avoid some of the obvious pitfalls of this type of research are presented in Appendix F.⁸⁰

Technology to improve learning

Technology can be used in far more meaningful ways than is currently typical in STEM classrooms. In addition to its use to save cost and time (e.g., putting a textbook, lecture, or assessment on-line) and disseminate learning and assessment materials (e.g., portals that enable educators to search for lessons online), far more dramatic change in education can be achieved with technologies that create a “cycle of innovation.” Globally available and shared assessment tools can evaluate student learning and feed learning data into central databases for researchers as well as learners and teachers, leading to continuous improvement of teaching and learning. As knowledge about learning evolves, this cycle of innovation can provide a natural route for continuous experimentation, with immediate feedback for many different types of classrooms and the provision of information to teachers about which methods are successful in particular settings. This process also can aid in providing researchers in the cognitive sciences with the data to develop generalizable principles about learning. Teachers will be able to adapt teaching

74. Rivard, L. P., & Straw, S. B. (2000). “The effect of talk and writing on learning science: An exploratory study.” *Science Education* 84 (5): 566-593.

75. Schwartz, D. L., & Bransford, J. D. (1998). “A Time for telling.” *Cognition and Instruction*, 16(4), 475-522.

76. Schwartz, D.L., C. Chase, C. Chin, M. Oppezzo, H. Kwong, S. Okita, G. Biswas, R.D. Roscoe, H. Jeong, and J.D. Wagster. (2007). “Interactive metacognition: Monitoring and regulating a teachable agent.” In D.J. Hacker, J. Dunlosky, and A.C. Graesser (Eds.), *Handbook of Metacognition and Education*. New York: Routledge.

77. Roy, H. (2003). “Studio vs interactive lecture demonstration—effects on student learning.” *Journal of College Biology Teaching* 29 (1): 3-6.

78. Knight, J. K. and W.B. Wood, W. B. (2005). “Teaching more by lecturing less.” *Cell Biology Education* 4, 298-310.

79. Hake, R. R. (1998). “Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses.” *American Journal of Physics* 66: 64-74.

80. See also: http://cst.yale.edu/sites/default/files/Active%20learning%20research%20table%2012-27-11_0.pdf.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

methods to maximize learning based on both specific data about their current students and research conducted across many classrooms. Expansive use of this innovation model, facilitated through use of technology, will provide ongoing improvement based on evidence, much like the software industry provides product updates based on user reports and patterns of use.

Actions to achieve Recommendation 1.

1-1 Establish discipline-focused programs funded by Federal research agencies, academic institutions, disciplinary societies, and foundations to train current and future faculty in evidence-based teaching practices.

Federal agencies, in particular NSF, should fund expansion of existing programs designed to train current faculty in effective college teaching methods and provide materials to support the application of such methods. These efforts should be undertaken in partnership with disciplinary societies and foundations, and with matching funds for faculty participation contributed by academic institutions. The expansion should make training available to faculty from diverse backgrounds to provide role models⁸¹ for all students and from all disciplines and types of institutions. Examples of model programs include the National Academies' Summer Institutes for Undergraduate Education in Biology⁸² and the American Physical Society's Faculty Workshops and the Association for Computing Machinery's Special Interest Group on Computer Science Education (SIGCSE) Symposium.^{83,84}

Key elements of the National Academies' Summer Institutes that could be shared as best practices include:

- demonstrate evidence-based teaching methods and engage participants in them as both teachers and learners;
- provide an understanding of the evidence supporting these methods;
- teach participants to use assessment effectively to increase learning and improve teaching;
- provide participants with an opportunity to develop new teaching materials with critical peer review and feedback;
- teach participants how to change their teaching and extend change beyond their own classrooms to foster institutional transformation on their campuses and discipline-wide transformation through their professional societies.

For change in STEM education to become pervasive and propagate independently, a substantial segment of the community needs to be trained so that the language and practice of evidence-based teaching is familiar and embedded in the habits of mind of STEM faculty. Successful programs should be expanded to reach 10-20% of the nation's 230,000 STEM faculty over the

81. The National Academies (2010). *Expanding Minority Participation: America's Science and Technology Talent at the Crossroads*. Washington, DC: National Academy Press.

82. Pfund, C., S. Miller, K. Brenner, K., Bruns, P., Chang, A., Ebert-May, D., et al. (2009). "Summer Institute to Improve University Science Teaching." *Science* 324(5926): 470-471.

83. See American Association of Physics Teachers, new Faculty Workshop: <http://www.aapt.org/Conferences/newfaculty/nfw.cfm>

84. Henderson, C. (2008). *American Journal of Physics* 76 (2), 179-187. <http://www.sigcse.org/events/symposia>

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

next five years. Based on existing teaching training programs, it is reasonable to expect trained faculty to influence the teaching of about 10 colleagues, making it possible to reach a substantial proportion of the STEM faculty through programs targeted at a subset of faculty. Moreover a group consisting of 10-20% of a STEM department's faculty is large enough to become self-sustaining. Such a group is also large enough to handle much or most of the introductory teaching. Therefore, the goal of reaching 10-20% of the STEM faculty directly could result in training most of those who teach in the first two years of college.

A total of \$10-15 million per year over 5 years will be required for the training of 23,000 to 46,000 STEM faculty. Funds for this training should be derived from a combination of Federal programs, academic institutions, disciplinary societies, and foundations. For example, funds from NSF's Advanced Technical Education could be used to support training for community college faculty. One possibility is that institutions and private donors could be exhorted to provide funds for this effort through capital campaigns with the theme "building the faculty of the future."

To train future faculty, Federal agencies should require all graduate students and postdoctoral fellows supported by institutional training grants to receive instruction in modern teaching practices. The competencies for postdoctoral researchers developed by the National Postdoctoral Association should receive particular attention.⁸⁵ Training could borrow models of success from, for example CIRTL,⁸⁶ an NSF-funded program that has created a national network of research campuses that train graduate students and postdoctoral fellows in evidence-based teaching across STEM disciplines. The National Academies Summer Institute model also could be integrated with the CIRTL model, whereby either trainees could attend regional training workshops or directors of campus training programs could be trained centrally and then return to campus to deliver independent teaching workshops. Between 2 and 5% of training grant funds should be set aside, or a supplement of this amount should be added to grants, to provide this instruction.

Using the lever of training grant funding to induce adoption of this training has two important outcomes beyond the students directly affected by the requirement. First, the training is likely to spread beyond the graduate students and postdoctoral fellows who are supported by the training grant. Many graduate students and postdoctoral fellows are eager for this training and will take advantage of it when it is available. Precedent for this is found in the requirement for ethics training instituted by NIH, which rapidly included most graduate students, independent of funding source, at many universities. The second key outcome is that the graduate students at research universities, many of whom are recipients of training grant support, are the future faculty at all types of institutions of higher education. They will therefore become the ambassadors for evidence-based teaching to a wide expanse of colleges and universities.

85. See The NPA Postdoctoral Core Competencies: <http://www.nationalpostdoc.org/publications/competencies>.

86. See The CIRTL Network: <http://www.cirtl.net>. <http://www.cirtl.net/>.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

1-2 Create the “STEM Institutional Transformation Awards” competitive grants program.

NSF should institute a competitive grants program designed to provide incentives for and facilitate transformational, sustainable innovations in the teaching and learning of STEM subjects at two- and four-year colleges. This program could be based on the NSF’s ADVANCE Program for increasing the participation of women in STEM⁸⁷ or on NSF’s Alliances for Graduate Education and the Professoriate, which was designed to increase the participation of minorities. Grants from each of these programs have been successful in effecting transformative change, as established by extensive national studies.^{88,89,90} These programs provide the best existing models for institutional level change, which has not historically been a target for Federal funding.

The key to these projects is that they focus on *institutional* change and the barriers to it. The interventions developed by each campus should be locally tested but transferrable. The model of the ADVANCE program indicates that a set of model campuses (approximately 100 for ADVANCE) can influence practices at many other campuses by setting an example of successful practices and providing materials that aid other campuses in implementation of similar practices. All ADVANCE projects constructed websites that provided information about program design, data on program impact, and transferrable materials that could be adapted by other campuses. Similarly, a plan to affect other institutions should be part of every STEM Institutional Transformation Award.

The key elements of the award program should include:

- A STEM department’s plan to improve education of students in the first two years according to features shown to be important to success of STEM students (see, for example, Table 3)
- Efforts to effect change at the department and institution level
- Sound evaluation to determine whether the interventions have influenced faculty practice and student persistence and performance
- Plan for sustaining programs beyond the duration of the grant
- Evidence of campus commitment to the project through matching institutional funds or other means
- Dissemination of materials to other campuses through websites and publications

Grants also should support putting into practice the large body of existing research on teaching and learning in STEM disciplines by creating incentives for individual departments or entire institutions to adopt or adapt evidence-based methods to improve STEM teaching and learn-

87. See ADVANCE program page: <http://www.nsf.gov/crssprgm/advance/index.jsp>.

88. Stewart, A., J. Malley, and D. LaVaque-Manty (Eds.). (2007). *Transforming Science and Engineering: Advancing Academic Women*. Ann Arbor: University of Michigan Press.

89. Sheridan, J.T., E. Fine, C.M. Pribbenow, J. Handelsman, and M. Carnes. (2010). “Searching for excellence & diversity: Increasing the hiring of women faculty at one academic medical center.” *Academic Medicine* 85(6): 999-1007.

90. Bilimore, D. (2011). *Gender Equity in Science and Engineering: Advancing Change in Higher Education*. New York, NY: Routledge Publishing Co.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

ing. The projects should focus on both faculty and department-level reward systems to induce sustainable change.

The grants program should allocate \$20 million per year over 5 years to fund a total of approximately 100 projects at around \$1 million (scaled to the appropriate funding level based on institution type and size). This level of funding would provide sufficient funding for a campus to hire, for example, a teaching expert to assist in development of teaching materials, an evaluator to study faculty behavioral change and effects on student persistence, and a part-time web expert to provide an interface with the central website designed to disseminate materials developed as part of the project. The funding could also be used, in part, to pay for faculty training such as that recommended above. The five-year duration is intended to provide sufficient time to observe change in practices by early adopters, extension of that change to other departments at their institutions, and sharing of progress across institutions through websites and publications. Based on the wildly different capacities and needs at different institution types, grants should be separately considered from community and technical colleges, 4-year colleges, and research institutions. Grants should be awarded based on how proposals address the specific needs of the STEM department or institution and proposed actions that will have the greatest impact on improving student learning and achievement.

Funding could come from enactment of NSF's proposed Widening Implementation and Demonstration of Evidence-Based Reforms (WIDER) program at the President's Fiscal Year 2012 requested level of \$20 million annually.

Project evaluation should focus on changed faculty habits and implementation of evidence-based teaching. In addition, the impacts of teaching practices on retention and on the performance of students in STEM majors should be measured. Granting agencies should not, however, focus on reporting of the effects of interventions on student learning. Assessment of learning is a standard part of teaching plans, and student persistence and performance (courses taken, grades, time to graduation) should be evaluated, but these measurements should be distinguished from experiments to compare student learning with lectures alone versus with evidence-based methods. The rationale for this is that evidence-based methods are predicated on research using randomized controlled trials comparing various teaching methods and we do not expect every faculty member teaching an introductory STEM course to perform sophisticated learning science experiments. It is far more important to document whether and how faculty are implementing the methods. Other sources of funding (such as NSF's Research and Evaluation on Education in Science and Engineering program) could be used to support sound experiments to continue to advance evidence-based learning.

Findings about changed faculty habits and student persistence and performance should be publishable, and materials that are developed should be shared with the academic community through web sites and other means. The grants should transform the campuses receiving them; in turn, these campuses should provide others with models and specific mechanisms for change. The sustainability of change should be planned and evaluated as part of the grant process.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

The unique power of educational technology should be harnessed to this end twofold: (1) to embed assessment into instructional activity and use the data gathered to create a virtuous cycle of innovation, sharing, evaluation, and improvement and (2) to disseminate information that can advance the transformation of other instructors, departments, and institutions. To the latter point, the Department of Education, through the First in the World Initiative or ARPA-Ed (described below under recommendation 2), should issue a request for proposals to produce an interactive, online presence to collect and share data on institutional change and improvement of postsecondary STEM education. Grantees funded by the STEM Institutional Transformation Grants should be required to post their curricula and methods to an online resource.

1-3 Request the National Academies develop metrics to evaluate STEM education.

To evaluate progress toward the goals presented in this report, campuses, funders, students, and accreditation agencies need a meaningful set of criteria by which to measure excellence in STEM teaching among instructors, departments, and institutions. Sufficient research now supports the elements presented here to provide a valid basis for evaluation and benchmarking. The National Science Foundation and Department of Education should provide funding to the National Academies to develop criteria for STEM evaluation based on the partial list provided in Table 3. Key among these criteria are the capacity to collect, analyze, and use data about teaching and learning; inclusion of effective programs to enhance participation by underrepresented students; incorporation of active student engagement in learning; provision of research experiences in the first two years of college; retention of students in STEM majors; clear demonstration that learning goals guide development of courses and curricula; training in teaching practices for current and future faculty; and evaluation of programs and instructors based on meeting learning goals.

These metrics could be adopted by independent organizations, including accreditation agencies, the Association of American Universities (AAU), the Association of Public and Land Grant Universities (APLU), the American Association of Community Colleges (AACC), or U.S. News and World Report, as a way of meaningfully evaluating the quality and success of STEM programs. This effort could be coordinated with ongoing work by AAU⁹¹ to develop a “STEM Certification” that would be granted to departments that provide outstanding STEM education based on the criteria developed by the National Academies. The inclusion of a STEM education criterion in evaluation of academic departments and institutions will enable prospective faculty and students to make informed judgments and faculty and administrators to benchmark their own progress toward building outstanding STEM undergraduate programs. When the National Academies develop the undergraduate STEM teaching and learning metrics, they might also consider options for collecting these data, such as the possibility of requiring institutions or STEM departments receiving Federal research funding to report on them. In this case, the responsibility for reporting would be that of the institution or STEM department, not the individual investigator.

91. See Association of American Universities Undergraduate STEM Education Initiative: <http://www.aau.edu/policy/article.aspx?id=12588>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table 3. Elements of Successful STEM Education Programs

Program Focus	Evidence and Resources
<i>Intellectually engage students</i>	
Teach science with evidence-based methods that engage students in creating and integrating knowledge	Springer, Stanne et al. (1999); AAAS (2011)
Focus on learning goals that involve both the process and content of STEM-related activities	AAAS (2011)
Involve students in research early, preferably as freshmen	Bartlett (2003); Carter, Mandell et al. (2009) Hathaway, Nagda et al. (2002); Hunter, Laursen et al. (2007); Kight, Gaynor et al. (2006); Kinkel and Henke (2006); Lopatto, Alvarez et al. (2008); Russell, Hancock et al. (2007)
Build alliances between community colleges and research universities to enhance the availability of research experiences to students at community colleges	Shaffer, Alvarez et al. (2010); Wei and Woodin (2011)
Facilitate study group formation and other structures that enable group learning	Burstyn, Sellers et al. (2004); Springer, Stanne et al. (1999)
<i>Personally engage students</i>	
Show relevance of STEM subjects to human and planetary problems	Donofrio, Russell et al. (2007); Buckley, Kershner, et al. (2004)
Provide role models of diverse backgrounds and life choices to inspire diverse students	Lockwood (2006); Stout, Nilanjana et al. (2011); Walton and Cohen (2011)
Provide opportunities for students to become part of STEM communities in classes, research laboratories, and STEM-related extracurricular activities	Kight, Gaynor et al. (2006); Peckham, Stephenson, et al. (2007)
Show students the diversity of careers in science	Campbell, Fuller et al. (2005)
Provide mentoring and tutoring to help students excel in STEM subjects	Muller (1997); Summers and Hrabowski (2006); Gilmer (2007)
Engage students' families in STEM-related academic experiences	Rodríguez, Guido-DiBrito et al. (2000); Ong, Phinney et al. (2006); Sy (2008)
Provide students with sufficient resources, including employment in laboratories and scholarships, to enable them to engage fully in academic life and the science and technology community	Barlow and Villarejo (2004)
Provide students with critical feedback and encouragement to give them realistic assessment of their performance in STEM subjects	Ovando (1994)
Build classroom communities in which students feel that they are being groomed for STEM fields rather than weeded out	Gainen (1995)
Build connections between higher education and industry to provide students with internships and exposure to potential career options	Gilmer (2007); Turner, Petzold, et al. (2011)
Provide undergraduate STEM pathways with access to role models by linking graduate training programs with undergraduate research programs	May and Chubin (2003)
Accommodate the needs of non-traditional students	Barlow and Villarejo (2004)
<i>Educate faculty</i>	
Provide faculty with training in teaching through campus programs, summer institutes, and programs organized by professional societies	Pfund, Miller et al. (2009); Yoon, Duncan et al. (2007)
Provide graduate students and postdocs with training in teaching through training grants and professional societies	University of Texas at Austin (2008); Bouwma-Gearhart (2007); Connolly (2008); Miller, Pfund et al. (2008)
Provide faculty with databases of learning tools and technology	University of Texas at Austin (2011)
<i>Assess outcomes</i>	
Assess understanding through diverse means, and articulate assessment with learning goals	Haudek, Kaplan et al. (2011)
Assess student retention in major	Wild and Ebbers (2002)
Measure achievement gap between various segments of student body and assess impact of interventions on gap	Haak, HilleRisLambers et al. (2011)
Evaluate teaching in terms of learning goals and how they are assessed and met	Felder, Rugarcia et al. (2000)
Improve learning assessment through technology development	Beatty (2004); Caldwell (2007)

Notes: See Appendix I for full references.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

Recommendation 2.

Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.

Rationale for Recommendation 2.

If we taught young people baseball history, statistics, and rules for years before we let them watch or play a game of baseball, how many would become fans or players? Probably few.⁹² But in STEM fields, most students must wait until they are quite far along in their studies before then can experience the excitement of scientific research. Solving real-world problems is far more inspiring and instructive than most of the STEM instruction that occurs in the first two years of college. Research experiences in the first two years of college enable students to choose majors based on the best and most creative aspects of STEM fields rather than on courses that do not reflect the nature of inquiry.

Every college student should be given the opportunity to generate scientific knowledge through research. Research experiences in the first two years increase retention of students in STEM majors and improve students' attitudes toward STEM fields.^{93,94,95} The effects of research experiences are quite positive for all students but have especially high impact for women and members of other groups currently underrepresented in STEM disciplines (Table 4).

Table 4. Impact of student research experience on students in STEM

Effect	Examples of studies demonstrating effect
Higher grades	Barlow and Villarejo (2004); Junge, Quiñones et al. (2010); Kinkel and Henke (2006)
Identification as a scientist or engineer	Hunter (2007)
Persistence in a STEM major	Barlow and Villarejo (2004); Carter, Mandell et al. (2009); Gilmer (2007); Kinkel and Henke (2006); Summers and Hrabowski (2006)
Shorter time to degree	Kinkel and Henke (2006)
Interest in post graduate education	Foertsch, Alexanmder et al. (1997); Hathaway, Nagda et al. (2002); Kight, Gaynor et al. (2006); Kinkel and Henke (2006); Lopatto (2004); Russell, Hancock et al. (2007)

Notes: See Appendix I for full references.

Not all college students can do research in faculty laboratories. Therefore, we propose the extensive use of research courses, which have been successfully implemented and rigorously studied at both large

92. Alison Gopnik. (1999). *Small Wonders*. The New York Review of Books.

93. Nagda, B. A., S. R. Gregerman, J. Jonides, W. von Hippel, and J.S. Lerner. (1998). "Undergraduate student-faculty research partnerships affect student retention." *The Review of Higher Education* 22: 55-72.

94. Russell, S. H., Hancock, M.P., and J. McCullough. (2007). op. cit.

95. Carter, F. D., M. Mandell, and K.I. Maton. (2009). "The Influence of On-Campus, Academic Year Undergraduate Research on STEM Ph.D. Outcomes: Evidence From the Meyerhoff Scholarship Program." *Educational Evaluation and Policy Analysis* 31(4): 441-462.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

and small institutions and have been proven to increase student knowledge of, enthusiasm for, and retention in STEM (e.g., see Appendix G).^{96,97}

Two strategies to engage students in research in their first two years are necessary: (i) widespread integration of research courses into the introductory STEM curricula, and (ii) increased opportunities for students to participate in faculty research programs in the first two years.

Actions to achieve Recommendation 2.

2-1 Expand the use of scientific research and engineering design courses in the first two years of postsecondary education through an NSF program.

All available data show that traditional cookbook, introductory laboratory courses which often involve repeating classical experiment to reproduce known results, rather than engaging students in experiments with the possibility of true discovery produce less learning, inspiration, and retention in STEM disciplines than do research courses. The data suggest that approaches to the development and scale-up of research courses should be made available through current and future faculty training programs and centralized websites and could be an important component of STEM Institutional Transformation Awards and STEM Certification (Recommendation 1-2). Research courses can act as training for subsequent participation in research in faculty or industry laboratories, improving the skills that students bring to those positions.

The National Science Foundation should provide initial funding to replicate and scale-up model research or design courses, possibly through the existing Transforming Undergraduate Education in STEM (TUES) program or the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP). On the order of thirty percent of the existing programs across STEM disciplines could be focused on funding for implementing research courses at postsecondary academic institutions at an annual cost of approximately \$12.5 million dollars, annually (based on Fiscal Year 2010 funding levels). Based on the range of funding for Type 3 TUES grants and Type 1 STEP grants, about 10 proposals per year at an average level of \$1.2 million could be awarded, in order to impact 100 campuses over the next 10 years.

Colleges and universities should seek to match NSF funding with private and philanthropic sources. Because research courses will replace expensive introductory laboratory courses, they should not require ongoing external support once the transition is accomplished.

2-2 Expand opportunities for student research and design in faculty research laboratories by reducing restrictions on Federal research funds and redefining a Department of Education program.

Independent research on faculty projects is a direct way for students to experience real discovery and innovation and to be inspired by STEM subjects. All relevant Federal agencies should rigor-

96. Bednarski, A.E., Elgin, S.C.R., and H.B. Pakrasi. (2005) "An Inquiry into Protein Structure and Genetic Disease: Introducing Undergraduates to Bioinformatics in a Large Introductory Course." *Cell Biology Education* Fall 2005.

97. Pope, W. H., D. Jacobs-Sera, et al. (2011). "Expanding the diversity of mycobacteriophages: insights into genome architecture and evolution." *PLoS One* 6(1): e16329.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

ously examine their programs which support undergraduate research and where there exists prohibitions, either in policy or practice, which would interfere with the recommendations of this report to support early engagement of students in research, these should be changed. Novel opportunities for research areas—for example, in theoretical areas without laboratories—should also be supported as arenas for involvement by students in the first two years.

Federal agencies should give special consideration to proposals for Federal training grants that establish collaborations between research universities and community colleges or other institutions that lack faculty research programs, including minority serving institutions that fall into this category. In these programs, graduate students supported on training grants would learn to be effective research mentors and have the opportunity to work with undergraduates from other institutions.

Potential sources of funding include redefinition of the Department of Education's \$1 billion Carl D. Perkins Career and Technical Education program when it comes up for reauthorization; specific focusing of Federal (NASA, Energy, Education, and USDA) investments in historically black colleges and universities, Hispanic-serving institutions, and tribal colleges for building institutional capacity; and NSF's Broadening Participation at the Core on supporting early research and building cross-institutional collaborations in undergraduate research.

Recommendation 3.

Launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap.

Rationale for Recommendation 3.

Students need mathematical and, increasingly, computational competency at a college level to succeed in STEM majors and jobs. This makes mathematics distinct from other disciplines, as it is a gateway to other STEM fields.

Mathematics instruction credit hours, particularly in the first two years, are dominated by “service courses”—mathematics courses that are taken because they are required by another major that uses mathematics in the discipline. This content is fundamentally different from how a pure mathematician thinks about mathematics or knows how to use it, which is problematic for teaching students the skills they need. Discipline-based education on effective undergraduate mathematics teaching also appears less developed when compared with other STEM fields.

Today, many students entering college do not meet the necessary mathematics standards. Among students who take the ACT entrance examination for college, just 43% achieve the ACT College Readiness Benchmark in math.⁹⁸ Because of inadequate preparation, many students need to take developmental classes in mathematics when they get to college. In addition, employers in the private sector, government, and military frequently need employees with a level of mathematics preparation that is hard to

98. The benchmarks specify the minimum scores needed on each ACT subject-area test to indicate that a student has a 50 percent chance of earning a grade of B or higher or about a 75 percent chance of earning a C or higher in a typical credit-bearing first-year college course in that subject area. ACT. (2011). *The Condition of College & Career Readiness 2011*. Iowa City, IA: ACT.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

find, placing the burden on employers to provide or obtain remedial education. This deficiency in mathematics skills imposes a burden on students, higher education, the military, and employers through the developmental education and worker training needed to produce a STEM competent workforce. Higher education alone spends at least \$2 billion dollars per year on developmental education.⁹⁹ This high cost for remediation is coupled to reported low effectiveness. Of those students who took remedial courses, less than 30% complete a bachelor's degree within eight years as compared to nearly 60% of students who required no remediation.¹⁰⁰ Additionally, a study of community college students reported that 60-70% of students who were placed in remedial mathematics never completed the required mathematics sequence and, therefore, never graduated.¹⁰¹ Reducing or eliminating the need for remedial mathematics classes or improving their cost and effectiveness is one of the most urgent challenges—and promising opportunities—in preparing the STEM workforce of the 21st century.

Undergraduate mathematics education in the U.S. is often below what is considered the appropriate university level in many countries. In 2005, 57% of the students enrolled in 4-year colleges and universities were enrolled in pre-college algebra, trigonometry, or other pre-calculus courses; the proportion is higher for 2-year institutions. Most U.S. postsecondary students terminate their college mathematics education at a pre-calculus course that is typically a review of high school algebra, trigonometry, and sometimes functions. Many students in these courses have seen 90% of the material in high school but are advised to take this course to make the transition to college easier.¹⁰² Such courses are frequently uninspiring, relying on memorization and rote learning while avoiding richer mathematical ideas.

As this is the last mathematics course for many college students, they often are left with the impression that the field is dull and unimaginative, and they can extend this judgment to all STEM disciplines. This is particularly harmful for students who later become K-12 STEM teachers. A focus on improving this particular type of course offers potentially enormous benefits.

Closing the mathematics-preparation gap would enable many more students to pursue STEM degrees in college. About 15% of 12th graders are interested in STEM fields but not proficient in mathematics, with women slightly more common in this category. Many of these students are not far from mathematics proficiency (see Appendix E). If the preparation of these students in mathematics could be enhanced, either before college enrollment or through improved remediation, many more students could be prepared to pursue STEM fields in college.

This problem is a complex one that has resisted the efforts of many dedicated people over a considerable period of time. Closing the mathematics-preparation gap requires coordinated action on many fronts starting in the earliest grades.¹⁰³ PCAST's report on K-12 STEM Education ("*Prepare and Inspire*"¹⁰⁴) contains several recommendations that involve colleges and universities in this effort. In particular,

99. Strong American Schools. (2008). *Diploma to Nowhere*. Washington, DC.

100. Strong American Schools. (2008). op. cit.

101. Bryk, A. S. and U. Triesman. (2010). "Make Math a Gateway, not a Gatekeeper." Washington, DC: *The Chronicle of Higher Education*.

102. Lutzer, D. J., S. B. Rodi, E. E. Kirkman, and J.W. Maxwell. (2007). *Statistical Abstract of Undergraduate Programs in the Mathematical Science in the United States: Fall 2005 CBMS Survey*. Providence, RI: American Mathematical Society.

103. National Mathematics Advisory Panel. (2008). *Foundations for Success*. Washington, DC: U.S. Department of Education.

104. President's Council of Advisors on Science and Technology (PCAST). (2010) *Report to the President: Prepare and Improve K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future*. Washington, DC: PCAST. <http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-stemed-report.pdf>.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

it calls for the Federal Government to establish the objective of recruiting, preparing, and providing induction support for at least 100,000 new middle and high school STEM teachers who have majors in STEM fields and strong content-specific pedagogical preparation. This Administration has embraced this goal, and the production of 1 million additional STEM graduates over the next decade could contribute substantially to meeting it.

Secondly, the Federal Government has a critical role in supporting the development of a knowledge base to close the mathematics-preparation gap. For example, research into the best ways to teach mathematics to college students so they can pursue STEM subjects in the first two years of college is badly needed. Some developmental mathematics courses have demonstrated effectiveness in increasing mathematics proficiency among those not ready for college-level mathematics and even in encouraging students intending to major in STEM subjects to persist to graduation and a STEM degree.¹⁰⁵ Mathematics education research should explore the attributes of these successful classes and ways to disseminate best practices.

Mathematics education research also could lead to innovative and effective ways to teach the subject—for example, through the use of games, simulations, and other technologies. Emerging computer-based technologies—intelligent tutors—based on the latest learning science hold promise for accelerating mathematics learning and achieving mathematics proficiency at less cost than current approaches (see Appendix E, Box E-1). Preliminary research suggests that intelligent tutors can increase mathematics test scores on the order of one to two standard deviations. Further development and broad diffusion of these tools can provide effective, low-cost strategies for accelerating mathematics learning among STEM-interested students.

In the *Prepare and Inspire* report, PCAST called for the creation of a mission-driven, advanced research projects agency for education (ARPA-Ed) that would propel and support (1) the development of innovative technologies and technology platforms for learning, teaching, and assessment across all subjects and ages, and (2) the development of effective, integrated, whole-course materials for STEM education. Many of these advances would benefit not only K-12 education but also the developmental courses that many students need to pursue STEM fields during the first two years of college.

Actions to achieve Recommendation 3.

3-1 Support a national experiment in mathematics undergraduate education at NSF, the Department of Labor, and the Department of Education.

The National Science Foundation and the Departments of Labor and Education should support a multi-campus five-year initiative aimed at developing new approaches to remove or reduce the mathematics bottleneck that is currently keeping many students from pursuing STEM majors. This national experiment should fund a variety of approaches, including (1) summer and other bridge programs for high school students entering college; (2) remedial courses for students in college, including approaches that rely on computer technology; (3) college mathematics

105. Bettinger E. and B. Long, B. (2009). "Addressing the Needs of Underprepared Students in Higher Education: Does College Remediation Work?" *Journal of Human Resources* 44(3): 736–771.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

teaching and curricula developed and taught by faculty from mathematics-intensive disciplines other than mathematics, including physics, engineering, and computer science; and (4) a new pathway for producing K-12 mathematics teachers from undergraduate and graduate programs in mathematics-intensive fields other than mathematics. Diverse institutions should be included in the experiment to assess the impact of the intervention on various types of students and schools. Outcome evaluations should be designed as a collective effort by the participating campuses and funding agencies.

Approximately 200 experiments at an average level of \$500,000 should be funded at institutions across the county, at an annual cost of \$20 million per year for five years. As mathematics preparation issues vary across the postsecondary spectrum, a variety of sources will be needed to fund experiments at diverse institution types. Funds for these experiments could be derived from a combination of the Department of Education's proposed First in the World Initiative, possibly the Department of Labor's Trade Adjustment Assistance Community College and Career Training initiative or Career Pathways Innovation Fund, and a strategic focus on mathematics of NSF's Transforming Undergraduate Education in STEM (TUES) program or Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) for the next five years.

Recommendation 4.

Encourage partnerships among stakeholders to diversify pathways to STEM careers.

Rationale for Recommendation 4.

Besides increasing student persistence in STEM education, more students need to be attracted to STEM disciplines to produce 1 million additional college graduates over the next decade. To take advantage of the breadth of talent in STEM fields, students who need non-traditional pathways to STEM degrees require special attention. Adult and working students and those from backgrounds atypical of traditional STEM students, including returning veterans, may need alternative pathways to be successful in STEM disciplines.

New STEM pathways need to offer nationally portable, industry recognized credentials that are integrated into for-credit academic degree programs. These programs provide bridges from high school to community colleges, from community colleges to 4-year institutions, and from all institution types to STEM jobs.

The sizeable group of high school dropouts who return to study for General Education Development (GED) tests offers a largely untapped source of students who could be interested in careers involving STEM fields. Some community colleges have begun offering programs that combine preparation for the GED tests with college courses that could serve as a gateway to further STEM courses and STEM-related careers. Adult students and those returning to college after time away, especially U.S. military veterans, also often have high levels of motivation and a focus on careers that could be channeled in the direction of STEM-related jobs.

Educators concerned with increasing the number of students in STEM disciplines have given much attention to "off-ramps," the drop-out and attrition patterns in high school, community colleges, and

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

four-year institutions. Equal attention should be given to on-ramps, multiple routes to enter or re-enter STEM education. Rather than a single pipeline that is prone to leakage, or a ladder where any missed step makes the next step too hard to reach, educators and policymakers should think of a network of pathways along which students can take different routes to STEM readiness and competency. If students have exited this network of pathways, they need accessible and cost-effective ways to get back on.

Many types of partnerships could aid in designing pathways to STEM training that would capture a broader portion of society. These partnerships can smooth the way from high school to college, link students at community and technical colleges with high-skill STEM jobs, enable students at two-year colleges to transfer and earn four-year degrees, provide research experiences to students at institutions without research programs, and offer students insight into the careers and opportunities for STEM practitioners in industry. These partnerships will enable the academic advancement of all types of students, but they will be particularly advantageous for students traditionally underrepresented in STEM fields.

Partnerships between high school and college.

To encourage the underrepresented majority to pursue STEM degrees, better integration between high school and college is needed. High schools and colleges could collaborate on development of bridge programs that would prepare students for college during the summer between high school and college (e.g., Appendix H, Box H-1 and H-2). Typically, high school juniors and seniors in these programs live on campus and receive classroom instruction, research experience, career counseling, SAT and ACT prep classes, and mentoring from students and faculty.

Most of these programs, such as Carnegie Mellon University's Summer Academy for Mathematics and Science¹⁰⁶ and the California State Summer School for Mathematics and Science,¹⁰⁷ are open to high school students statewide or nationwide. Some are aimed at the underrepresented majority to provide incoming students with the intellectual, personal, and social supports they will need to excel.

The majority of partnerships between high schools and colleges and universities that aim to increase the number of students entering STEM pathways do so indirectly by providing better teacher training and support, which in turn can lead to more students interested in STEM disciplines and better prepared to enter college. Such programs can train high school teachers to use new tools for active learning that engage students in hands-on STEM activities. These programs also can provide on-site coaching and leadership development for principals and other administrators.

Partnerships between two- and four-year institutions.

Two-year colleges are both a major source of STEM degrees and a conduit into STEM fields for many students, including many members of the underrepresented majority.¹⁰⁸ In many cases, 2-year colleges

106. See Carnegie Mellon University's website:

<http://www.cmu.edu/enrollment/summerprogramsfordiversity/sams.html>.

107. See California State Summer School for Mathematics and Science:

<http://www.ucop.edu/cosmos/>.

108. Chen, G. (2009) *The Minority Report: How Minority Students are Really Faring at Community Colleges*. Community College Review: <http://www.communitycollegereview.com/articles/202>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

are geographically closer to students who would have difficulty attending a four-year school. They also are typically less costly than 4-year institutions.¹⁰⁹

The transition from a 2- to 4-year college can be difficult, especially for members of groups underrepresented in STEM fields. For example, a recent study of women of color in STEM disciplines found that transfer rates are low for women of color, and retention rates of transfer students in STEM programs at 4-year institutions are even lower.¹¹⁰ Programs that align credentials between 2- and 4-year schools and provide support through the transfer process can increase the success rate for students in STEM fields.

Collaborative partnerships between 2-year colleges and 4-year institutions would provide greater access to and opportunities for advanced STEM education (see Appendix H, Box H-4) and advanced training for those students who do not pursue a 4-year degree. Large state systems, such as the University of California and California State University systems, have long-standing programs like MESA (Mathematics, Engineering, Science Achievement) that create partnerships between 4-year universities and neighboring 2-year colleges to align curricula and work with students to ensure that they are well-prepared for the transition to bachelor's degree programs in STEM disciplines.¹¹¹ Courses at the community college vetted by university faculty not only provide the necessary intellectual rigor but also allow students to develop relationships with faculty prior to transferring. In addition, students enrolled in these programs can be granted access to libraries and can be provided with opportunities to participate in cultural and athletic events at the university, helping them more easily integrate into campus life upon successful transfer.

Partnerships involving minority-serving Institutions.

Minority-serving institutions (MSIs) can serve as key intermediaries to improve the numbers, preparation, and diversity of students interested in STEM fields.^{112,113} For example, through a combination of bridge programs, building a community of support for STEM students, increasing student research opportunities, and reevaluating teaching and research practices, the University of Texas-El Paso has boosted graduation rates in STEM disciplines by nearly 50%, transforming it into the largest producer of Mexican-American STEM graduates in the Nation.¹¹⁴ Several White House initiatives have directed funds to MSIs to increase the number of minority students who not only start but finish STEM degree programs.¹¹⁵ Collaborative efforts between MSIs and other colleges and universities could greatly improve educational experiences in STEM disciplines. Programs that enhance STEM curricula at MSIs and that focus on improving the readiness of first-year students, often through summer research experiences and laboratory experi-

109. Phillippe, K.A. and L. Gonzalez Sullivan. (2005). *National Profile of Community Colleges: Trends & Statistics*. American Association of Community Colleges. Washington DC: Community College Press.

110. Reyes, M.-E. (2011). "Unique Challenges for Women of Color in STEM Transferring from Community Colleges to Universities." *Harvard Educational Review Summer*, 241-263.

111. See University of Texas-El Paso, Mesa: <http://mesa.ucop.edu/>.

112. Cullinane, J. and L. H. Leegwater. (2009). *Diversifying the STEM Pipeline: The Model Replication Institutions Program*. Washington, DC: Institute for Higher Education Policy.

113. Southern Education Foundation. (2005). *Igniting Potential: Historically Black Colleges and Universities and Science, Technology, Engineering and Mathematics*. Atlanta, GA.

114. Brown, S. (2009). "Making the Next Generation our Greatest Resource" in *Latinos and the Nation's Future*, H. Cisneros and J. Rosales (eds.) Houston, TX: Arte Publico Press.

115. See White House Initiative on Historically Black Colleges and Universities: <http://www2.ed.gov/about/inits/list/whhbcu/edlite-index.html>.

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

ences at partnering research universities, have shown marked success at both increasing enrollment and retention of students in STEM disciplines (see Appendix H, Box H-5).

Partnerships between the private sector and undergraduate STEM education.

Many U.S. businesses are active supporters of STEM efforts in high schools, colleges, and universities. Recently, however, the U.S. business community has recognized that its traditional role of partnering with existing institutions to promote best practices, provide resources, and involve corporate supporters offers some aid but is not likely to produce the radical change needed to meet future STEM workforce needs.¹¹⁶ Providing mentoring for promising STEM students through cooperative education, learn and earn, and internship programs is an important and proven avenue by which businesses can both recruit future workers and help students complete their studies. Not only do cooperative education experiences provide the kind of hands-on training shown to increase student retention in STEM programs, but they also produce students who more quickly integrate into the workplace and express higher rates of job satisfaction (e.g., Appendix H, Boxes H-6 and H-7).

There are several ongoing efforts in this area at the Federal level focused on distinct aspects of the STEM workforce, and these should be incorporated into a broader strategy for partnerships between industry and institutions of higher education to improve engagement and training of undergraduate students in STEM disciplines. For example, the President's Council on Jobs and Competitiveness¹¹⁷ has set a goal to double internship offerings from partnering businesses to increase the supply of qualified and trained American engineers.¹¹⁸ In addition, the Advanced Manufacturing Partnership,¹¹⁹ launched by President Obama in June 2011 in response to recommendations from a PCAST report on the topic,¹²⁰ has a workstream on education and workforce demand that is exploring opportunities for partnerships between employers and educational institutions, with a particular focus on community colleges but also including high schools and universities.

An untraditional avenue by which businesses can partner with universities to bolster pathways to STEM careers is to help transitioning employees become STEM educators. IBM launched such a program in 2005¹²¹ and has helped over 100 employees start new careers in teaching. The program works with university partners to provide employees who have engineering, health, computing, and science backgrounds with the resources needed to custom-tailor their own teacher preparation through on-line and traditional classes while retaining their jobs at IBM until their training is complete.

116. Hess, F.M., A.P. Kelly, and O. Meeks. (2011). *The Case for Being Bold: A New Agenda for Business in Improving STEM Education*. Washington, DC: Institute for a Competitive Workforce.

117. See President's Council on Jobs and Competitiveness website: <http://www.whitehouse.gov/administration/advisory-boards/jobs-council>.

118. See Jobs Council Internship Commitment Announcement. <http://energy.gov/articles/president-s-council-jobs-and-competitiveness-announces-industry-leaders-commitment-double>.

119. See <http://www.whitehouse.gov/administration/eop/ostp/pcast/amp>.

120. President's Council of Advisors on Science and Technology (PCAST) (2011). *Report to the President on Ensuring American Leadership in Advanced Manufacturing*. Washington, DC: PCAST. <http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-advanced-manufacturing-june2011.pdf>.

121. See IBM's 'IBM "Transition to Teaching" Teaching' Program: <http://www.ibm.com/ibm/responsibility/teaching.shtml>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Actions to Achieve Recommendation 4.

Increasing the number and strength of pathways to STEM fields during the first two years of college requires a coordinated strategy involving not just the Federal Government but K-12 education, higher education, businesses, and the nonprofit sector, including foundations. Still, the Federal Government can lead this effort through strategic planning, reallocation of funding, and strong leadership.

4-1 Sponsor at the Department of Education summer STEM learning programs for high school students.

The Department of Education should roll out the summer learning programs authorized in the 2007 America Competes Act (in an amendment introduced by then-Senator Obama), funded in part by the Federal Government, in partnership with state and local entities. To cover the full costs of such programs, state and local entities should recruit institutions of higher education and private industry as partners. As an expansion of the original proposal, these programs should be focused on mathematics, engineering, and science for high school students. In particular, these programs should provide mathematics instruction to prepare students to be college- and career-ready and provide hands-on STEM experiences. Based on the size of National Science Foundation's former Young Scholars Program for summer institutes, we recommend investment of \$10 million to fund approximately 100 projects reaching on the order of 5000 students, annually, including significant cost-sharing with academic institutions and private investors.

In addition, as authorized in the law, the Department of Education should establish a "Summer Learning Grants Website" that would provide information for students, parents, and educators on successful programs, curricula, and best practices for summer learning opportunities.

4-2 Expand a Department of Labor Program scope to encourage pathways from two-year to four-year institutions.

The mission of the Department of Labor's Trade Adjustment Assistance Community College and Career Training initiative should be expanded beyond development of important partnerships between community and technical colleges and employers in the private sector to encourage scientific research and engineering design exchanges across 2- and 4-year institutions. Alternatively, these activities could be funded through a strategic focus of the Department of Labor's Career Pathways Innovation Fund on research partnerships. NSF's Advancing Technical Education program could also be focused on cross institutional collaborations. The bridges described here should provide authentic STEM experiences for community college students on the 4-year campus and allow them to develop relations with faculty and the college or university community to ease the potential transition from a 2- to 4-year institution or to provide advanced experiences and inspiration for students who do not pursue a 4-year degree.

4-3 Establish public-private partnerships to support successful STEM programs.

To enhance students' STEM readiness, the Federal Government should engage private industry and foundations to support successful programs that create bridges between high schools and colleges and between 2- and 4-year institutions and ensure that programs incorporate learning standards and content consistent with industry-recognized skills. In the model of Change the

IV. A MULTI-FACTED APPROACH: REACHING THE TIPPING POINT

Equation, for which business leaders stood with President Obama and committed financial investment in strategies that work in K-12 STEM education, the President should call on foundations and private industry to commit to improving recruitment and retention in undergraduate STEM education and to partner with Federal agencies to expand education technologies, provide internships to students in the first two years of college, and invest in programs with proven success (such as cohort programs, bridge programs, and certification programs linking community college and technical education to industry-recognized standards).

Particular attention should be paid to U.S. military veterans who often have exceptional levels of motivation, maturity, and focus along with STEM skills gained during their service. Defense-related industries should consider partnerships with the Department of Defense and Veterans Affairs to support efforts to train and certify veterans for careers in STEM and STEM-capable fields. This commitment could involve industry offering internships and learn and earn programs to veterans who enroll in college to enhance their workplace experience and improve their job-readiness upon graduation.

4-4 Improve data provided by the Department of Education and the Bureau of Labor Statistics to STEM students, parents, and the greater community on STEM disciplines and the labor market.

The private sector and the Federal agencies that run laboratories and employ STEM professionals and the STEM-capable workforce have a vested interest in high-quality information about effective STEM education and relevant data about workforce supply, demand, and skill levels. Current data sources, however, limit their ability to answer important questions about the skills and choices of workers and about trends in the supply of and demand for a STEM and STEM-capable workforce. One way to help mitigate this data gap would be to resurvey members of cohorts followed in the High School and Beyond and National Education Longitudinal studies. Also, the National Center for Education Statistics within the Department of Education's Institute of Education Sciences should facilitate the enhancement of state student unit record systems to permit matching to postsecondary school data and labor market outcomes.

The Bureau of Labor Statistics should redefine employment categories around STEM jobs to reflect the breadth of jobs that require STEM skills, including STEM-capable jobs, such as medical and advanced manufacturing professionals and K-12 STEM educators.

Recommendation 5.

Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.

Rationale for Recommendation 5.

The leadership of higher education and STEM-dependent industries needs to be inspired to generate sweeping change in higher education to produce the workforce America needs. The leaders in these sectors need

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

to be challenged by the country's political leaders to think creatively, design and implement programs, to challenge existing reward structures, and to raise money from private donors to benefit STEM education. The White House should add its voice to this cause to help these leaders take charge of STEM education in their institutions and lead the way to new levels of achievement in STEM education.

Actions to achieve Recommendation 5.

The leadership of higher education and STEM-enabled businesses needs to be inspired to generate sweeping changes in higher education to produce the workforce America needs. Toward this end, we recommend that the President, via Executive Order, form a Presidential Council on STEM Education to provide advice and leadership on postsecondary STEM education. The council should include members that represent the breadth of academic institutions, professional societies, businesses, and private foundations involved in the development and use of human capital in STEM fields. Based on the guidance provided in this report, the council should make recommendations that advance the quality of postsecondary STEM education through all mechanisms available to the President. The council could provide a forum for leaders in the public and private sectors to weigh in on the development and deployment of metrics to evaluate STEM departments (Recommendation 1) and to design collaborative coalitions to support initiatives in STEM education (Recommendation 4), including expanding internship programs in industry and connecting industrial research agendas with research courses (Recommendation 2). In addition, it could provide advice and review for the National Experiment in Mathematics Undergraduate Education (Recommendation 3) and could conduct further study of the mathematics education issue, if necessary.



V. Engage to Excel: Summary of Recommendations, Actions, and Estimated Costs

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table 5: Engage to Excel: Summary of Recommendations, Actions, and Estimated Costs

1. Catalyze widespread adoption of empirically validated teaching practices.

Action	Agency and Estimated Cost
Establish discipline-focused programs funded by Federal agencies, academic institutions, professional societies, and foundations to train (1) current and (2) future faculty in evidence-based teaching practices.	<ol style="list-style-type: none"> 1. NSF and other agencies should partner with foundations and disciplinary societies to expand existing teacher training programs (\$10-\$15 M per year over five years to train 23,000 to 46,000 STEM faculty). 2. All agencies that provide training grants for graduate students and postdocs, through a combination of training grants and institutional funds.
(1) Create a "STEM Institutional Transformation Awards" competitive grants program at NSF.	1. NSF's proposed Widening Implementation and Demonstration of Evidence-based Reforms (WIDER) program. \$20 M per year over five years to fund 100 multi-year projects.
(2) Develop an online presence to share data and best practices.	2. Education through proposed First in the World Initiative or ARPA-Ed.
Request that the National Academies develop metrics to evaluate STEM education.	NSF and Education to request this study, with cost to be determined.

2. Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.

Action	Agency and Estimated Cost
Expand the use of scientific research and engineering design courses in the first two years through an NSF program.	NSF, with initial funding possibly through Transforming Undergraduate Education in Science (TUES) or Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) at \$12.5 M, annually (i.e. 10 Type 3 TUES or Type 1 STEP proposals per year at an average of \$1.2M).
Expand opportunities for student research in faculty laboratories by (1) reducing restrictions on Federal research funds, (2) giving special consideration to training grants that establish collaborations between research universities and other institutions, and (3) redefining a Department of Education program.	<ol style="list-style-type: none"> 1. All Federal agencies should make it possible to use undergraduate research program funds for first- and second-year students. 2. Federal agencies that fund programs for minority institutions could encourage cross-institution research partnerships. 3. Include research opportunities as technical education, such as that supported by the Department of Education's Carl D. Perkins CTE program.

3. Launch a national experiment in postsecondary mathematics education to address the mathematics-preparation gap.

Action	Agency and Estimated Cost
Support a national experiment in mathematics undergraduate education focused on: (1) summer programs; (2) remedial courses including use of technology; (3) discipline-based mathematics instruction, and (4) new pathways for K-12 mathematics teachers.	Fund 200 sites at an average of \$500,000 over five years, or \$20 M per year for five years, with funds from: NSF's TUES or STEP programs, DOL's Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program or Career Pathways Innovation Fund, and Education's proposed First in the World Initiative.

4. Encourage partnerships among stakeholders to diversify pathways to STEM careers.

Action	Agency and Estimated Cost
Sponsor summer STEM learning programs for high school students.	Education as authorized in the America Competes Act (\$10m to fund about 100 projects reaching on the order of 5000 students, annually).
Expand the scope of a DOL program and focus an NSF program to encourage pathways from 2-4 year institutions.	DOL's TAACCCT Grant Program initiative or Career Pathways Innovation Fund or NSF's Advancing Technical Education program to support community college-university or college research and design partnerships.
Establish public-private Agency-Institution-Industry partnerships to support successful STEM programs.	All STEM and education-focused Federal agencies.
Improve data provided to STEM students, parents, and the greater community on STEM education disciplines and the labor market.	<p>Department of Education should devote more resources to tracking students from high school into their careers.</p> <p>Bureau of Labor Statistics should redefine employment categories to include in "STEM" the breadth of jobs that require STEM skills.</p>

5. Create a Presidential Council on STEM Education with leadership from the academic and business communities to provide strategic leadership for transformative and sustainable change in STEM undergraduate education.



Appendix A: Experts Providing Input to PCAST

PCAST and its STEM Undergraduate Education Working Group express gratitude to the following individuals, who contributed input by attending meetings or by responding to requests for information:

Joann Boughman

Chief Executive Officer
American Society of Human Genetics

David Burgess

Professor of Biology
Boston College
Board Member, Treasurer, and Past-President
Society for the Advancement of Chicanos and
Native Americans in Science

Ashwin Ram

Director, Cognitive Computing Lab and Associate
Professor, College of Computing
Georgia Tech
Founder
Enkia Corporation

Cliff Adelman

Senior Associate
Institute for Higher Education Policy

Bruce Alberts

Editor-in-Chief
Science

Mary Ann Rankin

Dean, College of Natural Sciences
University of Texas at Austin

Joseph Aoun

President
Northeastern University

David Asai

Director of the Precollege and Undergraduate
Science Education Programs
Howard Hughes Medical Institute

Margaret Ashida

Project Director
Empire State STEM Education Initiative
Rensselaer Polytechnic Institute (RPI)

Debbie Bial

President
The Posse Foundation

Board on Science Education (BOSE)

Division of Behavioral and Social Science and
Education, National Research Council
The National Academies

Kenneth Boutte, Sr.

Professor of Biology and Associate Dean of
Summer Programs and External Initiatives
Xavier University of Louisiana

Michelle Cahill

Vice President for National Programs
Carnegie Corporation of New York

Anthony Carnevale

Research Professor and Director, Georgetown
University Center on Education and the
Workforce
Georgetown University

Julie Carruthers

Senior Science and Technology Advisor
Office of the Deputy Director of Science
Programs
U.S. Department of Energy

David Conley

Professor of Educational Policy and Leaders,
College of Education
University of Oregon

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Sandra Everett

Technical Projects and Training Manager
Lorain County Community College
Nord Advanced Technology Center

John Ewing

President
Math for America

Joan Ferrini-Mundy

Assistant Director for Education and Human
Resources
National Science Foundation

Norman Fortenberry

Executive Director
American Society for Engineering Education

Richard Freeman

Herbert Ascherman Chair of Economics
Harvard University

Jeff Froyd

Director of Academic Development, Dwight Look
College of Engineering
Project Director, NSF Foundation Coalition
Texas A&M University

William Gary

Vice President for Workforce Development
Northern Virginia Community College

Marybeth Gasman

Professor
University of Pennsylvania Graduate School of
Education

Howard Gobstein

Executive Vice President for Research, Innovation,
and STEM Education
Association of Public and Land Grant Universities
Co-Director
Science and Mathematics Teaching Imperative

William Goggin

Executive Director
Federal Advisory Committee on Student
Financial Assistance
U.S. Department of Education

Gary Green

President
Forsyth Technical Community College

Peter Henderson

Director
Board on Higher Education and Workforce
National Research Council
The National Academies

Gary Hoachlander

President
ConnectEd: The California Center for College
and Career

Freeman Hrabowski

President
University of Maryland, Baltimore County

Raynard Kington

President
Grinnell College

Kate Kirby

Executive Officer
American Physical Society

Mary Kirchhoff

Director
American Chemical Society Education Division

Ken Koedinger

Director
Pittsburgh Science of Learning Center
Professor
Human-Computer Interaction Institute
Carnegie Mellon University

APPENDIX A: EXPERTS PROVIDING INPUT TO PCAST

Dennis Kox

Manager
Advanced Manufacturing
Raytheon Missile Systems

Michael Lach⁺

Special Assistant
U.S. Department of Education

Alan Leshner

Chief Executive Officer
American Association for the Advancement of
Science
Executive Publisher
Science

James Lightbourne

Senior Advisor
Directorate for Education and Human Resources
National Science Foundation

Anne MacLoughlin

Senior Researcher
Center for Studies in Higher Education
University of California, Berkeley

Cathy Manduca

Director
Science Education Resource Center
Carleton College

Robert Mathieu

Professor of Astronomy
University of Wisconsin-Madison
Director
Center for the Integration of Research, Teaching,
and Learning (CIRTL)

Krish Mathur

STEM Liason
Office of Post Secondary Education
Program Officer
Fund for the Improvement of Postsecondary
Education
U.S. Department of Education

Irving McPhail

President and CEO
National Action Council for Minorities in
Education

Harris Miller

CEO and President
Association of Private Sector Colleges and
Universities (APSCU)

Mitzi Montoya

Vice Provost and Dean, College of Technology &
Innovation
Chair
Department of Technological Entrepreneurship &
Innovation Management
Arizona State University

Jeanne Narum

Director
Independent Colleges Office
Founding Director
Project Kaleidoscope

Patrick Natale

Executive Director, Chief Staff Officer and
Secretary
American Society of Civil Engineers

Ben Noel

President and Chief Executive Officer
360Ed

Willard Nott

Vice President for Public Awareness
American Society of Mechanical Engineers

Jane Oates

Assistant Secretary for Employment and Training
U.S. Department of Labor

Eduardo Ochoa

Assistant Secretary for Postsecondary Education
U.S. Department of Education

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Michael Pearson

Associate Executive Director
Mathematical Association of America

Jan Plass

Co-Director
NYU Games for Learning Institute (G4LI)
Founding Director
CREATE
Professor of Educational Communication and
Technology
New York University

Clifton Poodry

Director
Division of Minority Opportunities in Research
National Institutes of Health

Samuel Rankin, III

Associate Executive Director
American Mathematical Society

Mark Regets

Senior Program Officer
Board on Higher Education Workforce (BHEW)
National Research Council
The National Academies Senior Analyst
Science and Engineering Indicators Program
Division of Science Resources Statistics
National Science Foundation

Linda Roberts

Former Director
Office of Education Technology
U.S. Department of Education

Steven Robinson

Special Assistant
Office of Elementary and Secondary Education
White House Domestic Policy Council

Deborah Santiago

Co-founder and Vice-President for Policy and
Research
Excelencia in Education

Victor Santiago

Deputy Division Director
Division of Human Resource Development
National Science Foundation

Martin Scaglione

President and COO
Workforce Development Division
ACT, Inc.

Mel Schiavelli

President
Harrisburg University of Science & Technology

Betty Shanahan

Executive Director and Chief Executive Officer
Society of Women Engineers

Tobin Smith

Vice President for Policy
Association of American Universities

Blair Smith

Dean
College of Information Systems and Technology
University of Phoenix

Michael Staton

Chief Executive Officer and Co-Founder
Inigral, Inc.

Martin Storksdieck

Director
Board on Science Education
National Research Council
The National Academies

Vincent Tinto

Distinguished University Professor
Former Chair
Higher Education Program
Syracuse University

Mark Tomlinson

Executive Director and General Manager
Society of Manufacturing Engineers

APPENDIX A: EXPERTS PROVIDING INPUT TO PCAST

Josh Trapani

Senior Policy Analyst
Association of American Universities

Uri Treisman

Professor of Mathematics and Public Affairs
University of Texas at Austin
Founder and Director
Charles A. Dana Center

Jodi Wesemann

Treasurer and Member of the Board
Association for Women in Science

John Wilson

Executive Director
White House Initiative on Historically Black
Colleges and Universities

Michael Wolf

Supervisory Economist
Employment Projections Program
Bureau of Labor Statistics

Bill Wood

Co-Director
National Academies Summer Institute on
Undergraduate Education in Biology
Professor, Molecular, Cellular, and Developmental
Biology
University of Colorado at Boulder

Frederico Zaragoza

Vice Chancellor of Economic and Workforce
Development
Alamo Colleges

Rodney Ulane

NIH Training Officer
Director, Division of Scientific Programs
Office of Extramural Research
National Institutes of Health

* As of November 2011, Michael Lach serves as Director of STEM Education at the Urban Education Institute, University of Chicago.



Appendix B: Acknowledgements

PCAST wishes to express gratitude to the following individuals who contributed in various ways to the preparation of this report:

Asha Balakrishnan

Research Staff Member
Science and Technology Policy Institute

Greg Gershuny[‡]

Confidential Assistant
White House Office of Science and
Technology Policy

Michelle Costanzo

Student Volunteer
PCAST

Michael Feder

Policy Analyst
White House Office of Science and
Technology Policy

Dara Fisher

Student Volunteer
White House Office of Science and
Technology Policy

Kumar Garg

Policy Analyst
White House Office of Science and
Technology Policy

Gera Jochum

Policy Analyst
White House Office of Science and
Technology Policy

Thomas Kalil

Deputy Director for Policy
White House Office of Science and
Technology Policy

Brandon Ledford

Student Volunteer
PCAST

Elizabeth Lee

Research Assistant
Science and Technology Policy Institute

Justin Scott

Research Staff Member
Science and Technology Policy Institute

Sam Thomas

Research Assistant
Science and Technology Policy Institute

Maya Uppaluru

Student Volunteer
White House Office of Science and
Technology Policy

Carl Wieman

Associate Director for Science
White House Office of Science and
Technology Policy

[‡] Greg Gershuny left OSTP to join the White House Office of Presidential Personnel as the Energy and Environment Director in October 2011.



Appendix C:

STEM Higher Education Enrollment, Persistence, and Completion Data

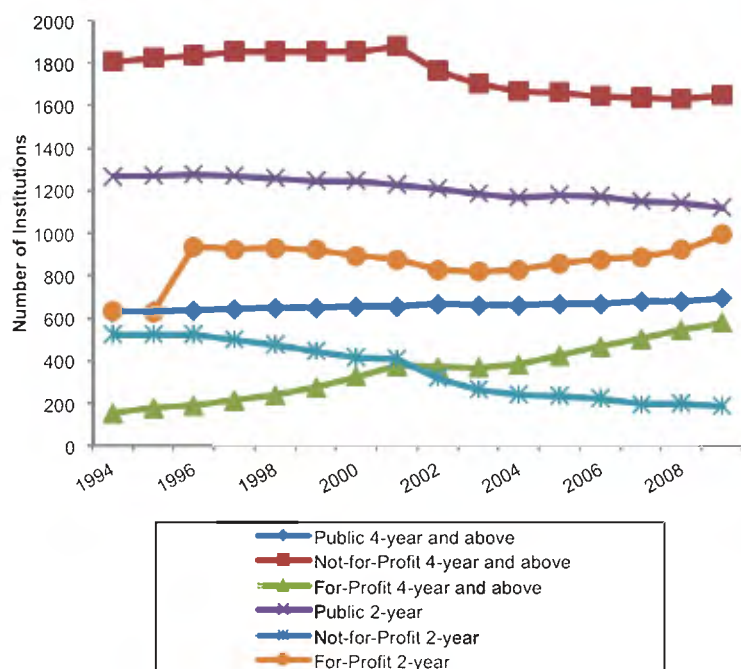
Appendix C describes data regarding the STEM enrollment, persistence and completion for students studying at post-secondary institutions. This appendix is the result of work done by Institute for Defense Analyses' (IDA) Science and Technology Policy Institute (STPI).

Figure C-1.	Number of Institutions by Sector, 1994 to 2009	49
Figure C-2.	Number of Institutions by Sector Breakdown, 2009	49
Figure C-3.	Total Undergraduate Enrollments in all Fields by Institutional Sector, 1999 to 2008	50
Figure C-4.	Total Undergraduate Enrollments Breakdown (in thousands), 2008	50
Table C-1.	Distribution of Gender by Institutional Sector When First Enrolled, 2003-04.	51
Table C-2.	Enrolled Major by Gender.	52
Figure C-5.	Percentage of Institutional Sector Enrollments by Field, 2003-04	53
Figure C-6.	Distribution of Race/Ethnicity by Institutional Sector When First Enrolled, 2003-04	54
Figure C-7.	Estimates of Enrolled Field by Gender	55
Figure C-8.	Estimates of Enrolled Field by Race/Ethnicity	57
Table C-3.	Persistence in Enrolled Majors Between 2003-04 and 2009 Among Bachelor's Degree Attainers	57
Table C-4.	2009 Attainment Level by Discipline When First Enrolled in 2003-04.	58
Figure C-9.	2009 Attainment Level by Discipline When First Enrolled in 2009	59
Table C-5.	2009 Attainment Level by Major When First Enrolled in 2003-04	60

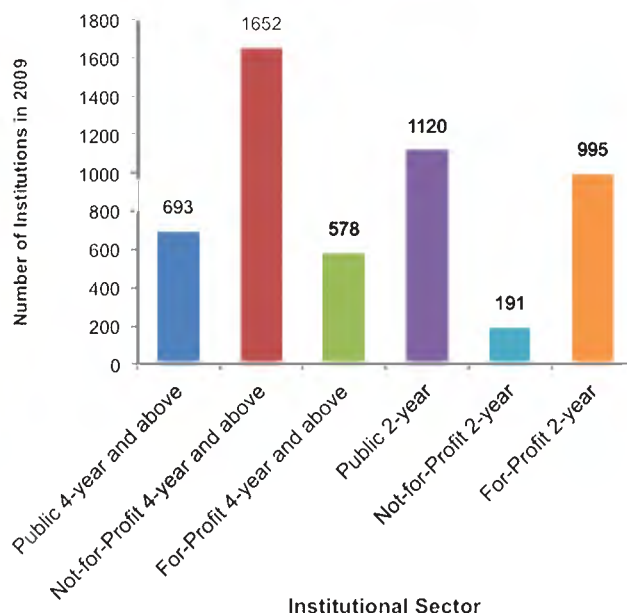
ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Table C-6.	STEM and Non-STEM Attainment by Major Field of Study in 2003-04	61
Table C-7.	STEM and Non-STEM Attainment by Demographic Characteristics	62
Figure C-10.	STEM and Total Degrees Conferred, 2001-009	63
Figure C-11	STEM Degrees as a Percentage of Total Degrees Conferred, 2001-2009	63
Figure C-12	STEM, Health, and Social Science Bachelor's Degrees, 1995-2009	64
Figure C-13	STEM, Health, and Social Science Associate's Degrees 1995-2009	65
Table C-8.	Percentage of Degrees Conferred by Race/ Ethnicity, 2009.	66

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Figure C-1. Number of Institutions by Sector, 1994 to 2009

Derived from: IPEDS, National Center for Education Statistics

Figure C-2. Number of Institutions by Sector Breakdown, 2009

Derived from: IPEDS, National Center for Education Statistics

Definitions of Institution Type and Institutional Control:

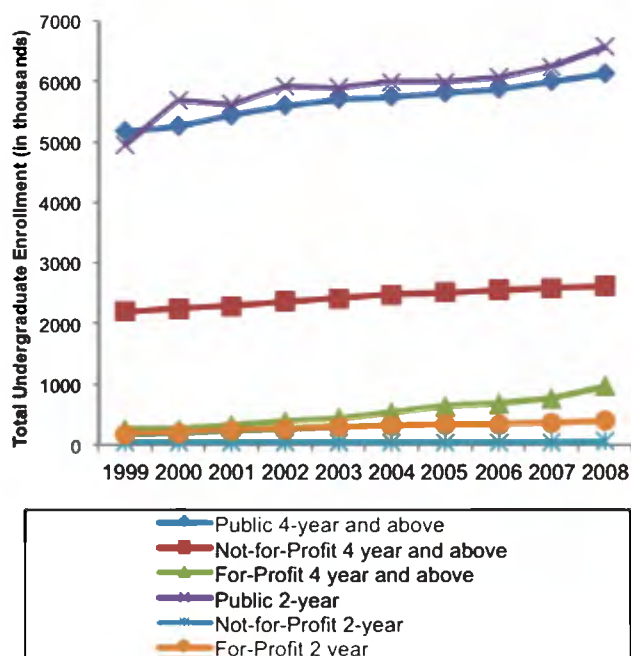
Public 4-year and above	Public institutions that have at least one-degree program that confers 4-year degrees; yet not all degrees conferred are 4-year degrees
Not-for-profit 4 year and above	Not-for-profit institutions that have at least one-degree program that confers 4-year degrees; yet not all degrees conferred are 4-year degrees
For-profit 4-year and above	For-profit institutions that have at least one-degree program that confers 4-year degrees; yet not all degrees conferred are 4-year degrees
Public 2-year	Public institutions that confer 2-year degrees; Often referred to as Community Colleges
Not-for-profit 2-year	Not-for-profit institutions that confer 2-year degrees
For-profit 2-year	For-profit institutions that confer 2-year degrees

Key Points (Figure C-1 and Figure C-2):

- Overall, the number of higher education institutions has remained steady over the past five years.
- There has been an increase in the number of for-profit institutions, and a slight decline in the number of not-for-profit institutions in the past decade.

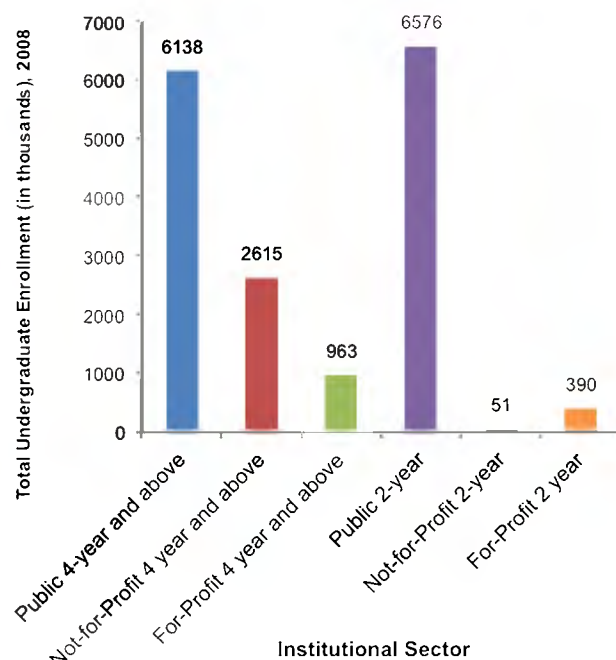
**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure C-3. Total Undergraduate Enrollments in all Fields by Institutional Sector, 1999 to 2008



Derived from: IPEDS, WebCASPAR

Figure C-4. Total Undergraduate Enrollments Breakdown (in thousands), 2008



Derived from: IPEDS, WebCASPAR

Key Points (Figure C-3 and Figure C-4):

- Four-year and above not-for-profit institutions outnumber the other institutions sectors.
- Enrollments at all institution types have been increasing steadily over the past decade.
- Public 4-year and 2-year institutions have larger enrollments than the other institution types.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Table C-1. Distribution of Gender by Institutional Sector When First Enrolled, 2003-04

Estimates (%)	Gender		Total
	Male	Female	
Total	42.5	57.5	100
First institution sector (level and control) 2003-04			
Public 4-year	44.8	55.2	100
Not-for-profit 4-year	43.9	56.1	100
For-profit 4-year	40.3	59.7	100
Public 2-year	43.4	56.6	100
Not-for-profit 2-year	42.5	57.5	100
For-profit 2-year	44.6	55.4	100

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09)

Key Points (Table C-1):

- The ratio of male students to female students across all institution sectors is fairly equal, with females representing about 55-60% of the student population.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table C-2. Enrolled Major by Gender

Major When First Enrolled in 2003-04												
Estimates (%)	STEM Majors										Total	
	STEM Total	Life Sci	Phys Sci	Math	Comp/ Info Sci	Engineering/ Eng Tech	Science Tech	Health Professions	Social Sci	Other Non-STEM		
Total	12.4	3.0	0.7	0.4	3.8	4.4	0.1	13.4	4	37.2	32.3	100
Gender												
Male	20.6	3.3	0.8	0.3	6.9	9.1	0.2	4.5	4.2	36.2	34.5	100
Female	6.3	2.7	0.6	0.4	1.5	1.0	0.1	19.9	5.1	38.0	30.7	100

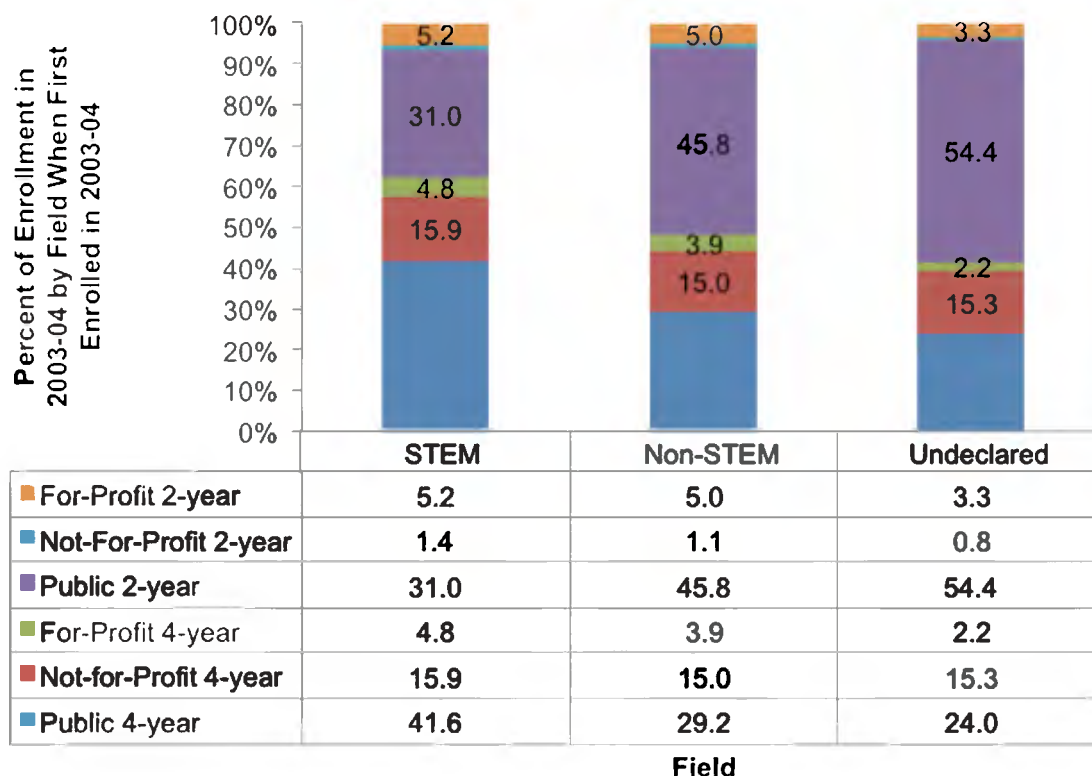
Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS/04/09).

Notes: Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate. Interpret data with caution. Estimate is unstable because the standard error represents more than 50 percent of the estimate. These data represent the percentage of students majoring in various disciplines when first enrolled at post-secondary institutions. However, these data do not represent the fields in which these students received degrees.

Key Points (Table C-2):

- Of those enrolled at postsecondary institutions, 12.4% of all students first enroll in a STEM discipline.
- Of males enrolled at postsecondary institutions, 20.6% first enroll in a STEM discipline.
- Of females enrolled at postsecondary institutions, 6.3% first enroll in a STEM discipline.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Figure C-5. Percentage of Institutional Sector Enrollments by Field, 2003-04

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

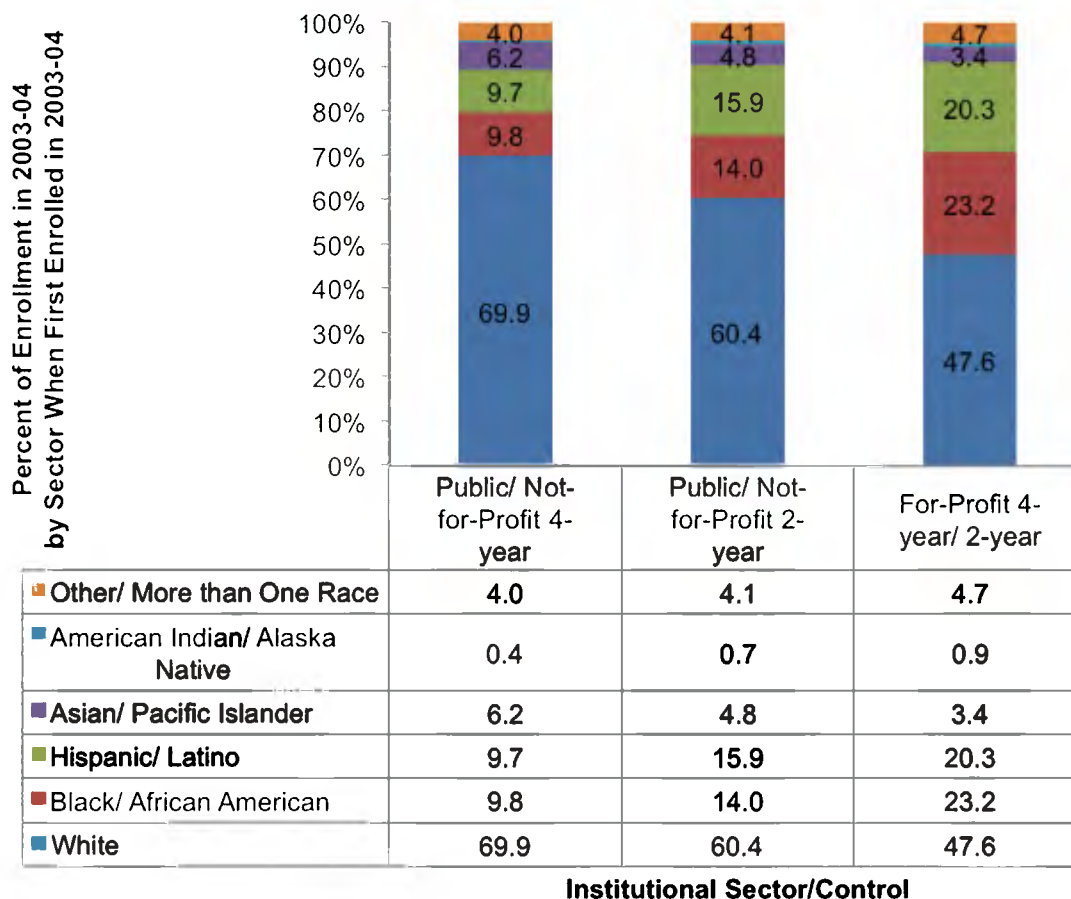
Notes: For-Profit 4-year Health Professions, Not-for-Profit 2-year STEM and Health Professions, For-Profit 2-year STEM and Health Professions data should be interpreted with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.

Key Points (Figure C-5):

- Of all students enrolled in STEM fields, 41.6% are enrolled at public 4-year institutions, 31.0% are enrolled in public 2-year institutions and 14.9% are enrolled in not-for-profit institutions.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure C-6. Distribution of Race/Ethnicity by Institutional Sector When First Enrolled, 2003-04



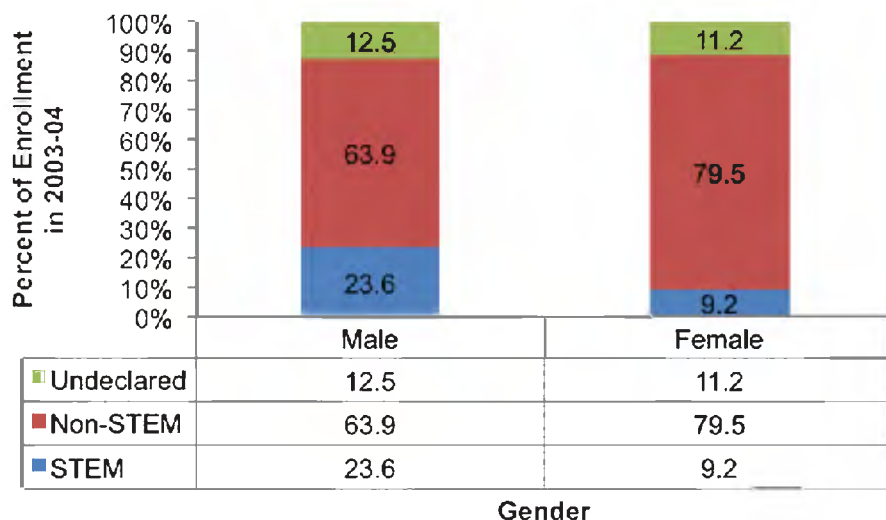
Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS04/09).

Notes: Asian/ Pacific Islander For-Profit 4-year/2-year data should be interpreted with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate. American Indian/ Alaska Native For-Profit 4-year/2-year data should be interpreted with caution. Estimate is unstable because the standard error represents more than 50 percent of the estimate.

Key Points (Figure C-6):

- Of those first enrolled across all disciplines at 4-year public or not-for profit institutions, 69.9% are white, 9.8% are black/African American and 9.7% are Hispanic/Latino.
- Of those first enrolled at the 2-year institutions, the percentage of whites is lower, and the percentages of underrepresented minorities are higher.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Figure C-7. Estimates of Enrolled Field by Gender

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

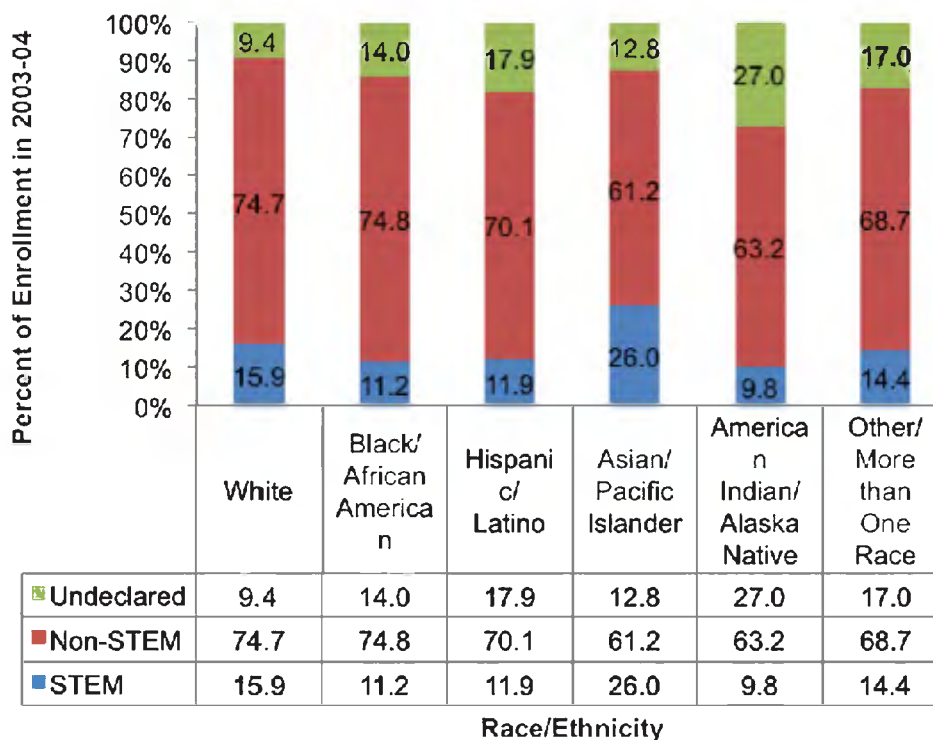
Notes: These data represent the type of field in which a student was last enrolled during the longitudinal survey follow up in 2009. This includes students who may have dropped out as it represents "field when last enrolled"—not taking into account whether or not the student completed a degree, was still enrolled or dropped out.

Key Points (Table C-7):

- During the second follow-up in 2009, 23.6% of male students when last enrolled at post-secondary institutions were enrolled in STEM fields.
- During the second follow-up in 2009, 9.2% of female students when last enrolled at post-secondary institutions were enrolled in STEM fields.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure C-8. Estimates of Enrolled Field by Race/Ethnicity



Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Notes: American Indian/ Alaska Native STEM and Health Professions data should be interpreted with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.

Key Points (Figure C-8):

- During the second follow-up in 2009, 26.0% of Asians and 15.9% of Whites were last enrolled in a STEM field, while 9.8-11.9% of underrepresented minority groups were last enrolled in a STEM field.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Table C-3. Persistence in Enrolled Majors Between 2003-04 and 2009 Among Bachelor's Degree Attainers

Major When Last Enrolled 2009											
Estimates (%)	STEM										Total
	Life Sci	Phys Sci	Math	Comp/ Info Sci	Engineering/ Eng Tech	Sci Tech	Social Sci	Health Professions	Other Non-STEM	Un-declared	
Total	7.9	1.8	1.3	2.5	6	0.0 !!	17.3	6.5	56.5	0.2 !!	100
Major when first enrolled in 2003-04											
Life Sci	56.5	4.3 !	0.8 !!	0	1.6 !	0	10.5	5.4	20.9	0	100
Phys Sci	23.1	35.4	3.6 !!	0	3.8 !!	0	13.5 !	2.6 !!	18.0 !	0	100
Math	2.3 !!	2.3 !!	54.9	1.4 !!	4.3 !!	0	15.3 !	0	19.5 !	0	100
Comp/Info Sci	1.2 !!	0	2.6 !	48.1	4.3 !	0	11.4	0	32	0.4 !!	100
Engineering/ Eng Tech	4.6 !	1.3 !	2.2 !	4.2 !	65.1	0	3.3 !	0.7 !!	17.8	0.9 !!	100
Social Sci	2.5 !	0.3 !!	0.3	0.1 !!	1.3 !!	0	65.7	1.2 !!	28.6	0	100
Sci Tech	+	+	+	+	+	+	+	+	+	+	100
Health Professions	13.8	1.2 !	0	1.1 !!	0.7 !!	0	7.8	43	32.4	0	100
Other Non-STEM	1.8	0.3 !	0.9 !	1	0.9	0	9.3	2.9	82.9	0	100
Undeclared	7.8	2.6	0.7 !	1.9 !	3.1	0.0 !!	22.7	5.1	55.5	0.5 !!	100

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Notes: + Reporting standards not met. ! Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate. !! Interpret data with caution. Estimate is unstable because the standard error represents more than 50 percent of the estimate.

Key Points (Table C-3):

- Among students first enrolled in Life Sciences in 2003-04, 56.5% attained a bachelor's degree in Life Sciences by 2009.
- Among STEM fields, bachelor's degree attainment within the field of original enrollment was highest among engineering and engineering technician enrollees at 65.1%.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

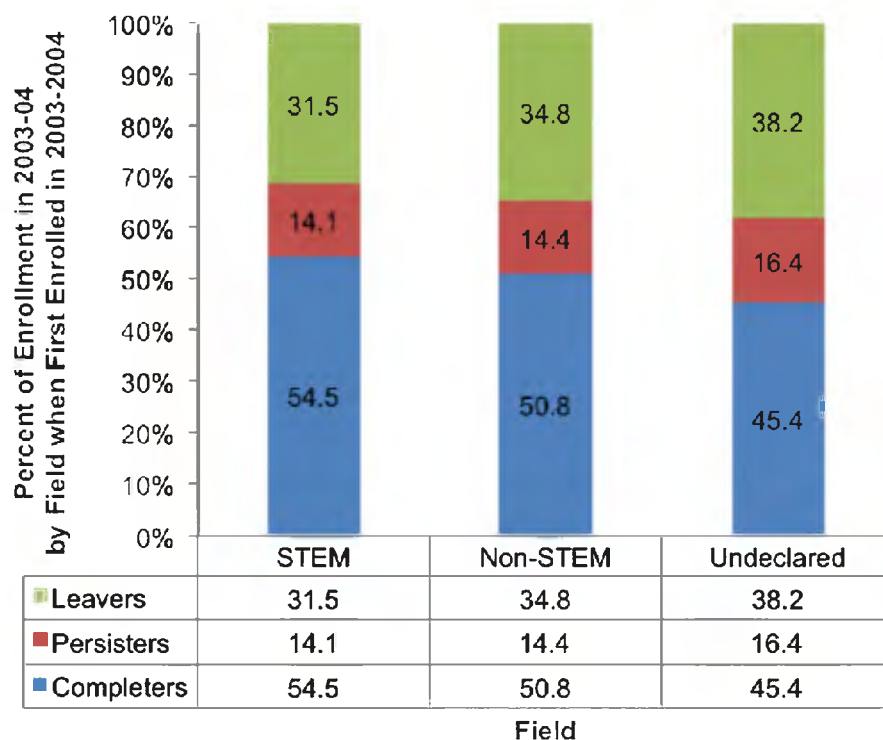
Table C-4. 2009 Attainment Level by Discipline When First Enrolled in 2003-04

Estimates (%)	Attainment or level at last institution enrolled through 2009						Total
	Completers			Persisters		Leavers	
	Attained bachelor's degree	Attained associate's degree	Attained certificate	No degree, enrolled at 4-year	No degree, enrolled at less-than-4-year	No degree, not enrolled	
Total	30.7	9.3	9.4	7.1	7.9	35.5	100
Field when First Enrolled in 2003-04							
STEM	40.8	10.0	3.7	8.6	5.5	31.5	100
Non-STEM	30.0	10.2	10.6	6.8	7.6	34.8	100
Undeclared	28.1	7.6	9.7	6.9	9.5	38.2	100

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Key Points (Table C-4):

- Students first enrolled in STEM fields have a higher degree of postsecondary degree attainment than students first enrolled in other fields.
- 40.8% of students first enrolled in a STEM field attained a bachelor's degree in any field, while 30.0% of students in a non-STEM field and 28.8% of students who were first undeclared attained a bachelor's degree.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA**Figure C-9. 2009 Attainment Level by Discipline When First Enrolled in 2009**

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Notes: The attainment levels are aggregated into three higher-level categories: completers, persisters, and leavers.

Key Points (Figure C-9):

- Overall, 31.5% of students first enrolled in STEM had no degree and were no longer enrolled after the 6 year follow-up, while 34.8% of non-STEM students and 38.2% of undeclared students had dropped out.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table C-5. 2009 Attainment Level by Major When First Enrolled in 2003-04

Attainment or level at last institution enrolled through 2009							
Estimates (%)	Completers		Persisters		Leavers		Total
	Attained bachelor's degree	Attained associate's degree	Attained certificate	No degree, enrolled at 4-year	No degree, enrolled at less-than-4-year	No degree, not enrolled	
Total	30.7	9.3	9.4	7.1	7.9	35.5	100
Major when first enrolled in 2003-04							
Life Sci	56.7	8.6	1.8 !	9.3	4.0	19.5	100
Physical Sci	57.9	6.1 !!	3.7 !	8.7 !	4.6 !	18.9	100
Math	54.6	7.4 !	4.1 !	0.0	1.7 !!	32.3	100
Comp/ Info Sci	20.6	15.6	3.8	8.6	7.4	44.0	100
Engineering/ Eng Tech	44.6	8.0	4.6 !	8.8	5.7	28.3	100
Science Tech	35.9 !	11.8 !!	1.8 !!	4.3 !!	19.4 !!	26.9 !	100
Social Sci	50.7	6.7	1.4	8.0	8.6	24.5	100
Health Professions	17.7	11.6	19.3	4.8	9.7	37.0	100
Other Non-STEM	31.7	10.1	8.7	7.4	6.6	35.6	100
Undeclared	28.1	7.6	9.7	6.9	9.5	38.2	100

Derived from: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Notes: ! Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.

!! Interpret data with caution. Estimate is unstable because the standard error represents more than 50 percent of the estimate.

Key Points (Table C-5):

- Students first enrolled in life sciences or physical sciences are more likely to attain bachelor's degrees in **any** field (not necessarily a STEM field) than students first enrolled in non-STEM fields.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Table C-6. STEM and Non-STEM Attainment by Major Field of Study in 2003-04

Estimates (%)	Degree Attainment and Persistence as of 2009					Total
	Completers		Persisters		Leavers	
	Attained a STEM degree	Attained non-STEM degree	No degree; enrolled in a STEM field	No degree; enrolled in a non-STEM field	Left postsecondary education without a degree	
Total	8.1	42.2	1.8	13.5	34.5	100
Major field of study in 2003-04						
STEM	35.1	21.6	5.7	8.9	28.7	100
• Math	40.3	27.3	0.0	1.9 !!	30.5 !	100
• Life Sci	37.8	31.9	3.7	9.7	16.8	100
• Physical Sci	41.3	28.1	2.1 !!	11.5 !	16.9	100
• Eng/ Eng Tech	41.8	16.9	7.2	7.9	26.2	100
• Comp/ Info Sci	24.6	16.7	6.6 !	9.3	42.7	100
• Science Tech	‡	‡	‡	‡	‡	100
Non-STEM	3.1	48.7	1.0	13.6	33.6	100
Undeclared	6.1	39.1	1.6	15.0	38.3	100

Derived from: Preliminary Estimate - U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

Key Points (Table C-6):

- Among students first enrolled in STEM fields, 35.1% of students attained a STEM degree.
- Among the STEM fields, students first enrolled in physical science and engineering/engineering technology had the highest percentage of degree attainment within a STEM field at above 40% while computer science had the lowest at 24.6%.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table C-7. STEM and Non-STEM Attainment by Demographic Characteristics

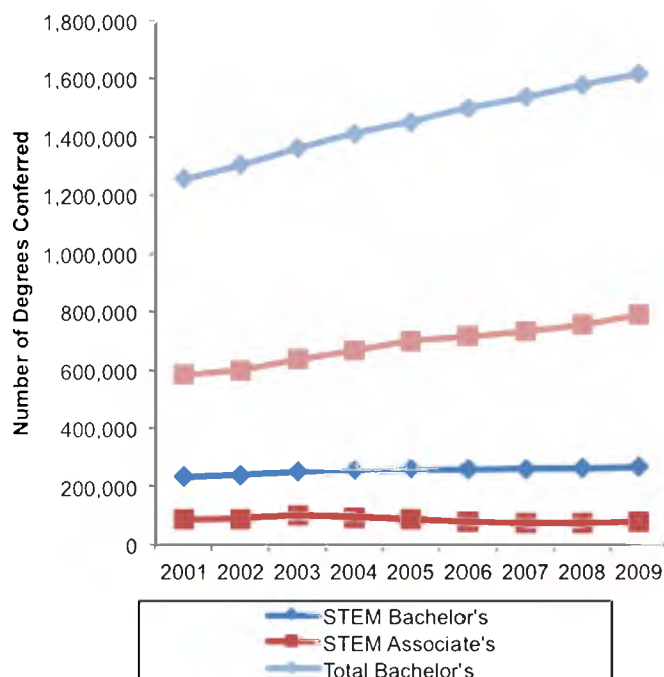
Estimates (%)	Persistence in STEM field (excl social/behavioral sci) as of 2009					Total
	Completers		Persisters		Leavers	
	Attained a STEM degree	Attained non-STEM degree	No degree; enrolled in a STEM field	No degree; enrolled in a non-STEM field	Left without a degree	
Total	8.1	42.2	1.8	13.5	34.5	100
Gender						
Male	12.1	35.3	3.2	13.2	36.1	100
Female	5.1	47.3	0.7	13.6	33.3	100
Race/ethnicity						
White	9.3	46.2	1.8	10.9	31.9	100
Black/ African American	4.1	32.6	1.2	19.5	42.7	100
Hispanic/ Latino	4.8	36.9	1.6	15.3	41.3	100
Asian	15.9	40.6	3.7 !	17.6	22.2	100
American Indian/ Alaska Native	5.7 !!	25.5	0.3 !!	26.0 !	42.6	100
Native Hawaiian/ other Pacific Islander	4.9 !!	36.9 !	0	22.7 !!	35.5 !	100
Other	7.9 !	37.8	1.4 !!	21.1	31.7	100
More than one race	7.0	37.5	2.7 !	16.8	36	100

Derived from: Preliminary Estimate - U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

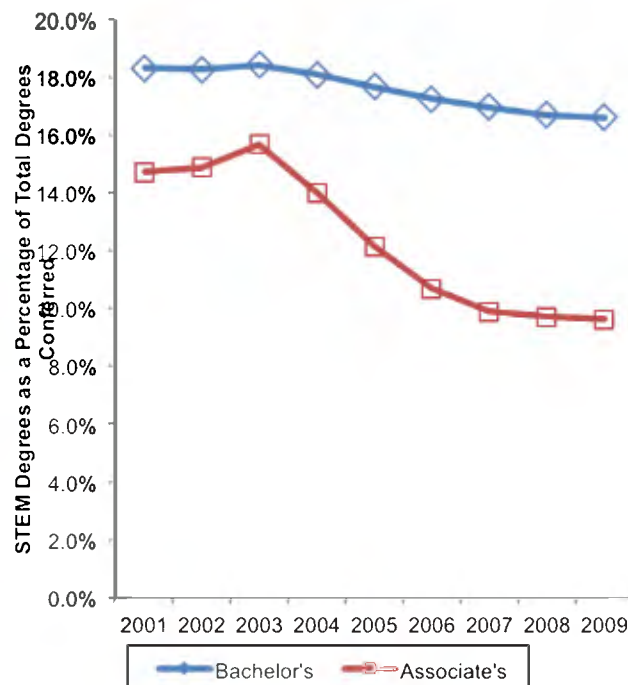
Key Points (Table C-7):

- Overall, 8.1% of who entered postsecondary education in 2004/5 had attained a STEM degree by 2009.
- Among male and female students who entered postsecondary education in 2004/5, 12.1% and 5.1% attained a STEM degree, respectively.
- Asian and White students had the highest percent of degree attainment within a STEM field at approximately 16% and 9%, respectively, while a distribution of 4-6% of underrepresented minorities attained STEM degrees within their race/ethnicity groups.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA

Figure C-10. STEM and Total Bachelor's and Associate's Degrees Conferred, 2001-2009

Derived from: NCES, IPEDS, WebCASPAR

Figure C-11. STEM Bachelor's and Associate's Degrees as a Percentage of Total Degrees Conferred, 2001-2009

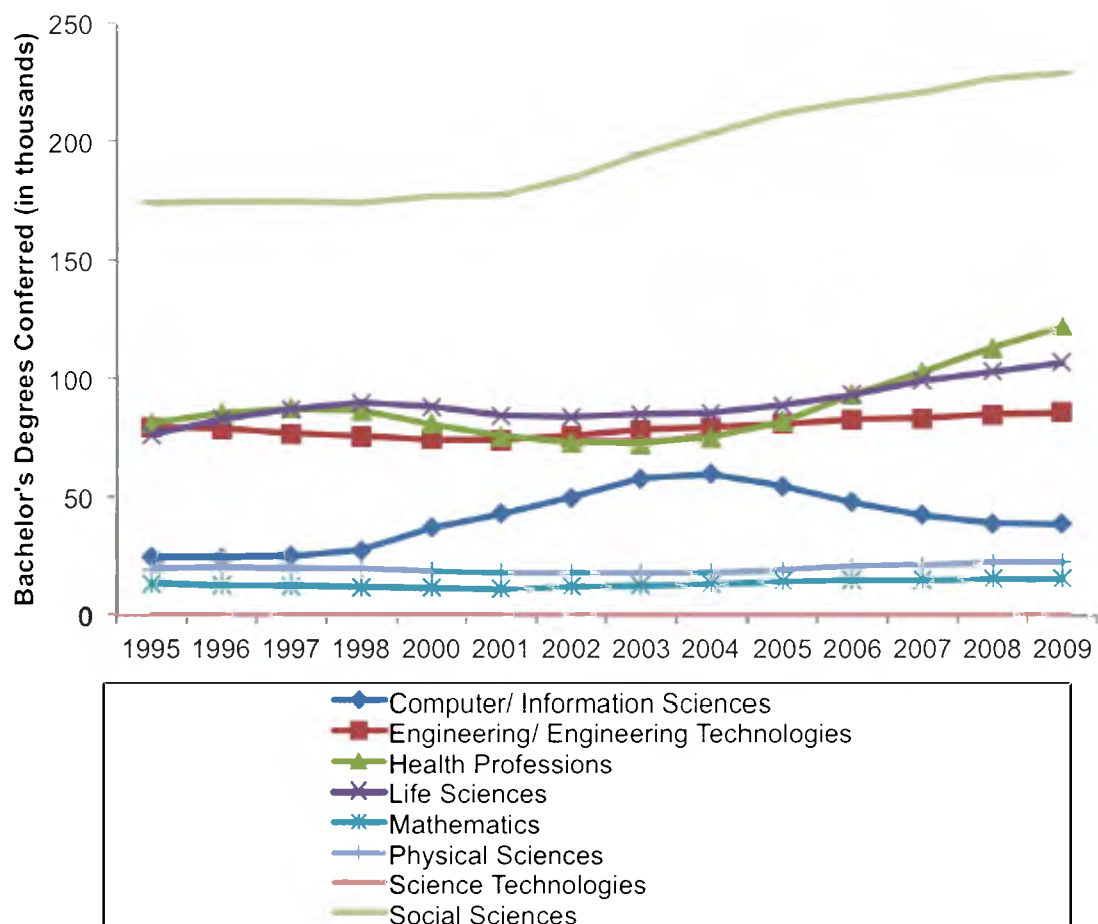
Derived from: NCES, IPEDS, WebCASPAR

Key Points (Figure C-10 and Figure C-11):

- A greater number of bachelor's degrees are conferred than associate's degrees.
- A greater percentage of bachelor's degrees than associate's degrees are conferred in STEM fields.
- STEM degrees as a percentage of all degrees conferred has declined since 2001 at both the bachelor's and associate's degree levels.
- The percentage of STEM associate's degrees conferred decreased sharply between 2003 and 2005, but has since leveled off. This trend is mostly due to the rise in associate's degrees in health professions and the decrease in associate's degrees in computer/information sciences.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

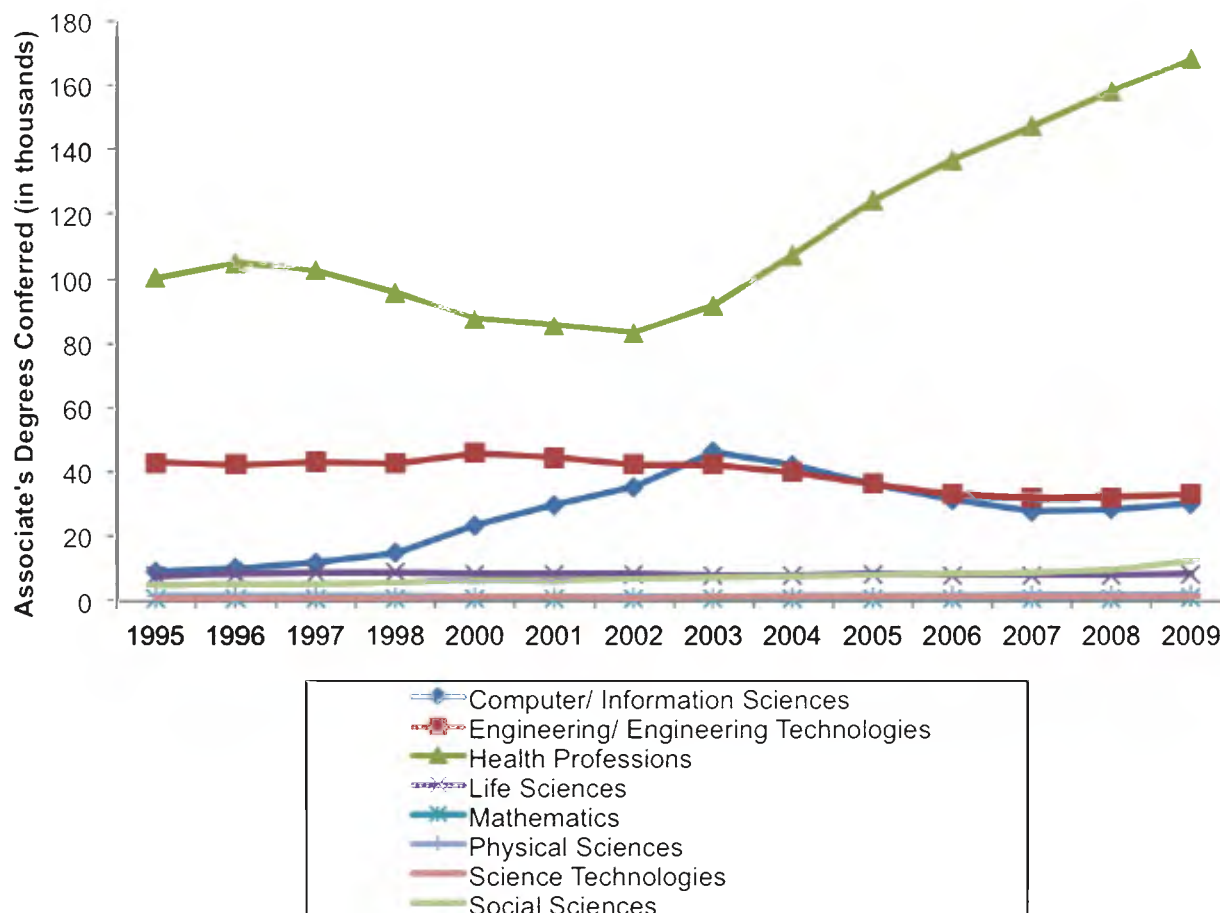
Figure C-12. STEM, Health, and Social Science Bachelor's Degrees Conferred, 1995-2009



Derived from: NCES, IPEDS, WebCASPAR

Key Points (Figure C-12):

- Computer/information science bachelor's degrees increased from 2000 to 2004, but reverted back to 2000 levels from 2005 to 2009.
- Engineering/engineering technologies bachelor's degrees have remained steady over the past decade.

APPENDIX C: STEM HIGHER EDUCATION ENROLLMENT, PERSISTENCE, AND COMPLETION DATA**Figure C-13. STEM, Health, and Social Science Associate's Degrees Conferred, 1995-2009**

Derived from: NCES, IPEDS, WebCASPAP

Key Points (Figure C-13):

- Compared to conferred bachelor's degrees, a greater proportion of associate's degrees are conferred in health professions and computer/ information sciences.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table C-8. Percentage of Degrees Conferred by Race/Ethnicity, 2009

Percentage of Degrees Conferred in 2009											
STEM Majors											
Race/Ethnicity	STEM Total	Life Sci	Physical Sci	Math	Comp/ Info Sci	Engineering/ Eng Tech	Sci Tech	Social Sci	Health Professions	Other Non- STEM	Total
White	14.4	4.9	1.1	0.7	2.7	5.0	0.1	9.7	12.3	63.5	100
Black	10.6	2.9	0.6	0.4	3.4	3.3	0.1	10.2	13.9	65.3	100
Hispanic	11.9	3.4	0.7	0.5	2.6	4.7	0.1	10.5	10.8	66.8	100
Asian/ Pacific Islander	23.0	10.0	1.7	1.1	3.0	7.1	0.1	12.5	11.0	53.5	100
American Indian/ Alaska Native	13.1	4.9	1.0	0.4	2.6	4.1	0.1	9.6	12.6	64.7	100

Derived from: NCES, IPEDS, WebCASPAR

Key Points (Table C-8):

- Among all White students who received degrees in 2009, 14.4% obtained degrees in a STEM field.
- Across all race/ ethnicity categories, White and Asian/Pacific Islander students obtained STEM degrees at the highest percentages at 14% and 23%, respectively. That is, among the Asians who earned degrees in 2009, 23.0% of the degrees are in STEM. Among underrepresented minorities, 10.6% of Blacks and 11.9% of Hispanics earned degrees in STEM.



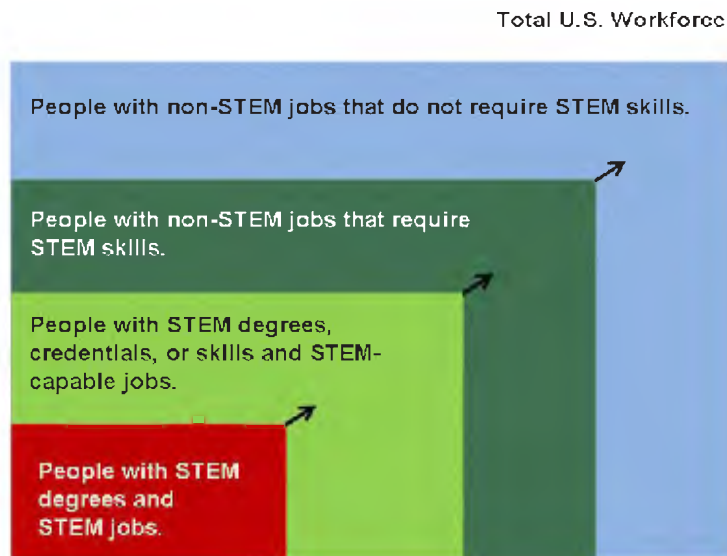
Appendix D: Economic Analysis of STEM Workforce Need

Appendix D describes data regarding the demand for STEM workers and the anticipated supply of STEM undergraduates from post-secondary higher education institutions. This appendix is the result of work done by IDA's Science and Technology Policy Institute.

Figure D-1.	Estimated Percentages of Females in STEM Occupational Groups, 2001, 2005, and 2009 (Data Labels Indicate 2009 Values)	68
Table D-1.	Estimated Number of Employed Persons and Percentage of Unemployed (Compared to Entire Labor Force), 2005-2009	70
Table D-2.	Fastest Growing Jobs as Reported by the Bureau of Labor Statistics, 2008–2018.	71
Figure D-2.	Estimated Race/Ethnicity of Labor Force in All STEM Occupations, 2001, 2005, and 2009	72
Figure D-3.	Historical and Projected Educational Attainment in STEM Occupations, Various Years from 1983 through 2018.	73
Figure D-4.	New and Replacement Job Openings and Occupational Distribution between 2008 and 2018	74
Table D-3.	Percent of Labor Force with Bachelor's STEM Degrees (Columns) in Corresponding STEM Occupations (Rows)	75
Figure D-5.	Total Job Openings and the Distribution of Educational Demand within Occupations	76
Figure D-6.	Projected Job Openings in STEM Occupations, 2008–2018	78

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure D-1: STEM Workforce Definition



Note: The categories of jobs that require STEM skills and understandings are expanding, generating additional demand for workers with STEM degrees.

- **STEM Professionals.** Workers who regularly draw on their expertise in STEM fields—including scientists, engineers, mathematicians, and technicians in STEM occupations—make up a relatively small but essential fraction of the U.S. workforce. They advance the frontiers of knowledge in industry, government, and academia, generating the new ideas and technologies that can transform entire industries and sectors of society. In colleges and universities, they also educate future generations of scientists, engineers, technicians, and mathematicians along with other students who will draw on STEM knowledge throughout their lives.
- **The STEM-Capable Workforce.** A much larger group of workers, whom we categorize in this report as the STEM-capable workforce, routinely use knowledge and skills developed in STEM fields as part of their jobs. Many of these people have STEM degrees or certificates but are working in jobs that would not be formally categorized as STEM occupations. At one end this group shades into the ranks of STEM professionals who develop and apply new knowledge. At the other end it shades into workers in all professions who use information and capabilities derived from science, technology, engineering, and mathematics to analyze, communicate, innovate, manage, and strategize. For example, physicians, nurses and other health workers generally are not categorized as STEM professionals, yet many of these individuals draw heavily on STEM knowledge and skills in their jobs. As another example, the advanced manufacturing workforce requires proficiency in math, technology, and engineering principles to succeed in their jobs, from entry-level workers through graduate-degreed engineers.

APPENDIX D: ECONOMIC ANALYSIS OF STEM WORKFORCE NEED

- *Non-STEM Workers Who Draw on STEM Skills.* Many occupations today require higher levels of familiarity with STEM subjects than they did in the past.¹²² A proxy for these increased demands is the increasing level of education required for many jobs. Between 1973 and 2008, the share of jobs in the U.S. economy that required postsecondary education increased from 28% to 59%, and this percentage is projected to continue to increase.¹²³ While college provides knowledge and skills other than STEM capabilities, the prominence of STEM subjects in higher education suggests that at least part of what employers are seeking is greater familiarity with STEM concepts and skills and STEM-derived technologies. One of many examples would be a market researcher who uses statistical techniques to draw conclusions; such a worker might fall into either this category or the previous category depending on the exact nature of the job.
- *Non-STEM Workers Who Do Not Draw on STEM Skills.* Many jobs in the economy do not draw directly on STEM skills. To again cite a specific example, athletes, singers, actors, and other entertainers typically do not draw on STEM subjects to do their jobs. However, even these individuals may need to master specific STEM content—for example, to devise a training regimen, or to create or disseminate artistic materials using new technologies.

In general, no job is completely isolated from the influence of new technologies and new ideas. All Americans regularly encounter the products of science, technology, engineering, and mathematics in their jobs and in their daily lives, though they may not recognize the connection with STEM subjects. The decisions individuals make in supermarkets, doctors' offices, and voting booths often depend at least in part on ideas drawn from STEM fields. To the extent that people are comfortable and familiar with STEM concepts, they are better able to take advantage of new opportunities and make good decisions on STEM-related issues. In doing so, they help create a cultural environment that is conducive to STEM endeavors and to the benefits those endeavors can produce.

122. Bresnahan, Timothy F., Erik Brynjolfsson, and Lorin M. Hitt. (2002). "Information Technology, Workplace Organization and the Demand for Skilled Labor: Firm-Level Evidence." *Quarterly Journal of Economics*, 117, 339-376. For a contrasting view, see: Michael J. Handel. (2005). "Worker Skills and Job Requirements: Is There a Mismatch?" Washington, DC: Economic Policy Institute.

123. Carnevale, Anthony, Nichole Smith, and Jeff Strohl. (2010). "Help Wanted: Projections of Jobs and Education Requirements through 2018." Washington, DC: Georgetown University Center on Education and the Workforce.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Table D-1. Estimated Number of Employed Persons and Percentage of Unemployed (Compared to Entire Labor Force), 2005-2009

Occupation	2005			2006			2007			2008			2009		
	Employed	%Un emp.*		Employed	%Un emp.*		Employed	%Un emp.*		Employed	%Un emp.*		Employed	%Un emp.*	
All Occupations	137,147,492	6.9%		142,545,193	6.4%		143,630,939	6.3%		147,486,711	6.3%		141,932,926	9.8%	
All STEM Occupations	7,112,960	3.3%		7,347,542	2.6%		7,369,304	2.5%		7,744,152	2.6%		7,498,307	5.2%	
All STEM Managers	548,618	2.9%		581,833	2.0%		602,188	1.7%		645,681	2.4%		635,896	4.6%	
All Computer Occupations	2,996,823	4.0%		3,110,616	2.9%		3,164,358	2.9%		3,297,403	2.8%		3,315,697	5.2%	
All Mathematical Occupations	162,123	2.1%		163,212	2.1%		168,721	2.6%		178,357	1.5%		187,337	3.4%	
All Engineers	1,833,225	2.6%		1,854,730	1.9%		1,837,649	1.7%		1,906,983	1.9%		1,777,445	4.4%	
All Engineering Technicians	686,259	4.0%		710,790	4.0%		728,494	3.4%		767,355	4.0%		650,708	9.5%	
All Life and Physical Scientists	382,472	2.7%		394,300	2.3%		423,308	2.2%		430,841	2.3%		625,330	3.0%	
<i>All Life Scientists</i>	232,008	1.5%		254,607	1.3%		239,823	2.0%		285,454	2.0%		266,868	2.0%	
<i>All Physical Scientists</i>	346,370	2.5%		357,387	1.8%		326,480	2.4%		360,300	2.3%		358,462	3.8%	
All Science Technicians	307,534	4.4%		314,367	4.5%		301,591	4.6%		302,619	4.6%		305,894	6.9%	

Derived from: American Community Survey one-year estimates, Census Bureau; data retrieved from IPUMS-USA database.

Note: * %Unemp. indicates percentage of labor force that is unemployed.

Key Points (Table D-1):

- STEM occupations make up approximately 5.6% of the employed labor force in the United States.
- From 2005 through 2009, STEM occupations fared well compared to the general workforce; the total unemployment percentage for all STEM jobs was typically about half of that for the entire occupational labor force.
- Overall, the number of STEM workers in the labor force grew from 7.5 million in 2005 to over 7.9 million in 2009.

APPENDIX D: ECONOMIC ANALYSIS OF STEM WORKFORCE NEED

Table D-2. Fastest Growing Jobs as Reported by the Bureau of Labor Statistics, 2008–2018

Occupation	Percent Change	Number of New Jobs	Median Annual Wage (May 2008)
Biomedical Engineers	72	11,600	\$77,400
Network Systems and Data Communications Analysts	53	155,800	\$71,100
Home Health Aides	50	460,900	\$20,460
Personal and Home Care Aides	46	375,800	\$19,180
Financial Examiners	41	11,100	\$70,930
Medical Scientists (Except Epidemiologists)	40	44,200	\$72,590
Physicians Assistants	39	29,200	\$81,230
Skin Care Specialists	38	14,700	\$28,730
Biochemists and Biophysicists	37	8,700	\$82,840
Athletic Trainers	37	6,000	\$39,640

Derived from: Bureau of Labor Statistics Occupational Employment Statistics and Division of Occupational Outlook.

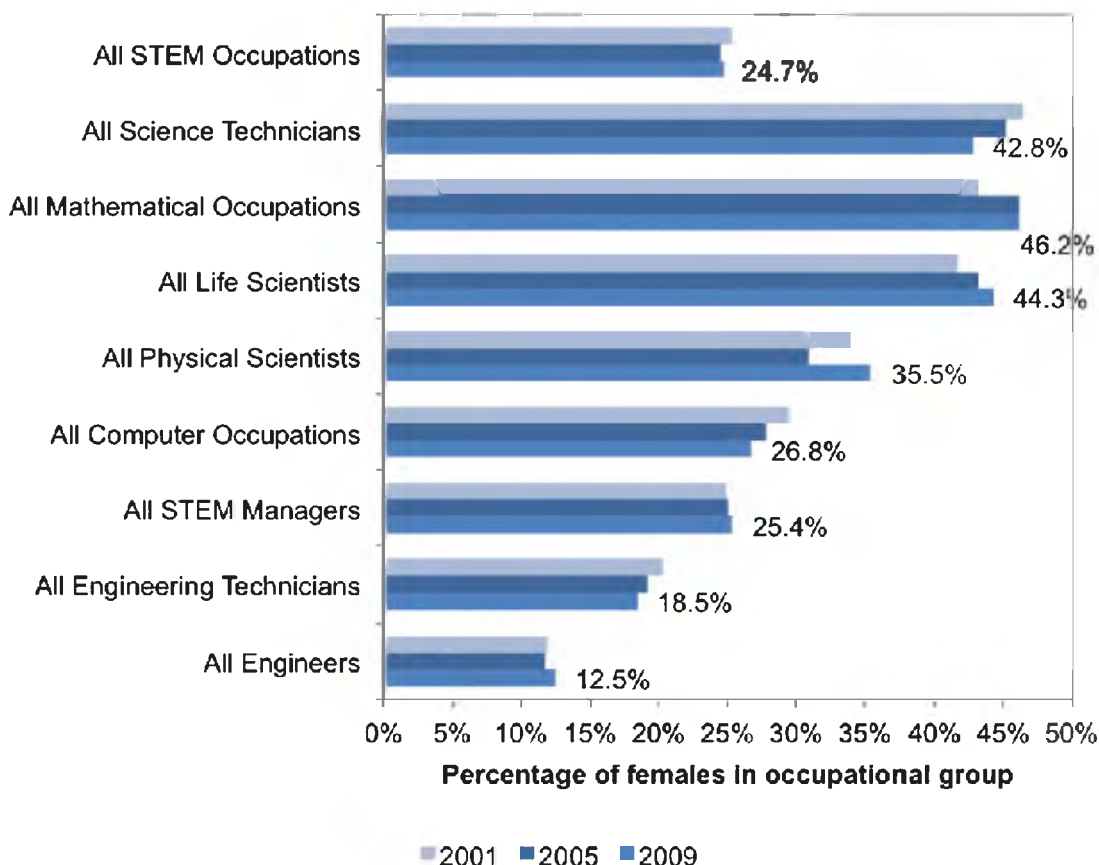
Note: Highlighted rows indicate STEM-related occupations.

Key Points (Table D-2):

- Though the Bureau of Labor Statistics does not have an official STEM designation for categorizing occupations, those commonly labeled as STEM in other research appear as some of the fastest growing in the most recent employment projections.
- While the absolute number of new jobs being created for biomedical engineers as well as biochemists and biophysicists remains relatively low compared to others on this list, the median wages earned by all of the fastest growing STEM occupations are some of the highest among all occupations.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

**Figure D-2. Estimated Percentages of Females in STEM Occupational Groups,
2001, 2005, and 2009 (Data Labels Indicate 2009 Values)**

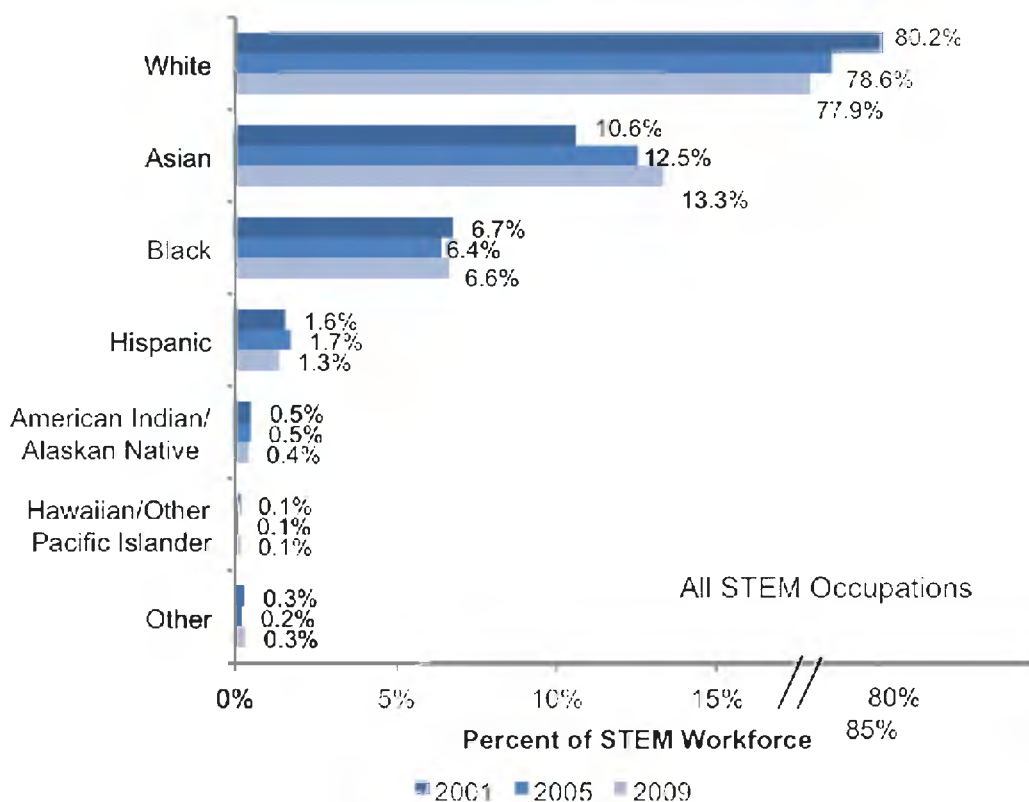


Derived from: American Community Survey of The Census Bureau, 2001, 2005, 2009 (one-year estimates); data retrieved from IPUMS-USA database.

Key Points (Figure D-2):

- Overall, the average percentage of females in all STEM occupations in 2009 (25%) was the same as in 2001.
- The ratio of female to male workers remains low despite large numbers of women entering selected occupational fields (e.g., life sciences) over the past decade.
- The number of women in STEM occupations in 2009 ranged from as low as 9% in some engineering fields to upwards of 46% in mathematical occupations.

APPENDIX D: ECONOMIC ANALYSIS OF STEM WORKFORCE NEED

Figure D-3. Estimated Race/Ethnicity of Labor Force in All STEM Occupations, 2001, 2005, and 2009

Derived from: American Community Survey of The Census Bureau, 2001, 2005, 2009 (one-year estimates); data retrieved from IPUMS-USA database.

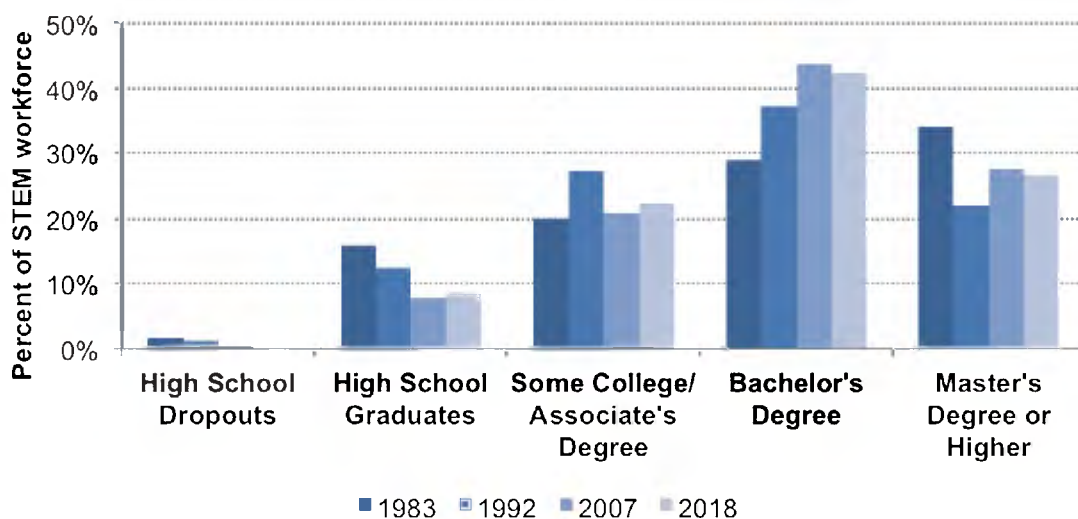
Note: Detailed data for all ethnicities and STEM occupational groups are available in Appendix C.

Key Points (Figure D-3):

- The percentage of various race/ethnicities across STEM occupations has remained stable from 2001 through 2009. One exception is Asians, who have moved from 10.6% of all STEM occupations in 2001 to 13.7% in 2009.
- The trends in race/ethnicity vary when looking at specific occupational groups. For example, in the life sciences (not shown), the percentage of Whites has decreased significantly from 2001 to 2009, and much of that employment has shifted to Asians.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

**Figure D-4. Historical and Projected Educational Attainment in STEM Occupations,
Various Years from 1983 through 2018**



Derived from: Camevale, Anthony, Nichole Smith, and Jeff Strohl. (2010). *Help Wanted: Projections of Jobs and Education Requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.

Note: The definition of STEM used here includes the following occupations and corresponding standard occupational classifications (SOC): computer and mathematical science occupations (SOC 15-1011-SOC 15-2099), architecture and architectural technician occupations (SOC 17-1011-SOC 17-1022; SOC 17-3012-SOC 17-3019; SOC 17-3031); engineers and engineering technician occupations (SOC 17-2011-SOC 17-2199; SOC 17-3021-SOC 17-3031); life and physical sciences occupations (SOC 19-1011-SOC 19-2099; SOC 19-4011-SOC 19-4099); social sciences occupations (SOC 19-3011-SOC 19-3099).

Key Points (Figure D-4):

- Based on the Center on Education and the Workforce's projections and a historical analysis of BLS data, the authors revealed a trend through 2018 that more STEM occupations will demand education that includes at least some college.
- Over time, the population of STEM workers that are high school dropouts or high school graduates decreases to 8.8% by 2018, thus indicating that 91.2% of STEM workers will need at least some post-secondary education.

APPENDIX D: ECONOMIC ANALYSIS OF STEM WORKFORCE NEED

Table D-3. Percent of Labor Force with Bachelor's STEM Degrees (Columns) in Corresponding STEM Occupations (Rows)

STEM Occupations	STEM Bachelor's Degrees										% of Corresponding Labor Force with any STEM Bachelor's Degree
	All Comp & Info Sys	All Mathematics	All Engineering	All Eng Techs	All Life Sciences	All Phys Sciences	All Science Techs	All STEM Education	Eng and Industrial Mgmt	Multi- disciplinary or General Science	
All Computer Occupations	18.8%	3.1%	12.3%	0.9%	1.7%	2.0%	0.1%	0.2%	0.1%	0.7%	40.0%
All Mathematical Occupations	5.9%	16.0%	6.0%	0.4%	3.4%	2.2%	0.1%	0.5%	0.1%	0.8%	35.5%
All Engineers	1.2%	0.7%	43.1%	2.0%	1.4%	1.7%	0.2%	0.1%	0.1%	0.5%	50.9%
All Engineering Technicians	0.5%	0.2%	4.9%	1.2%	1.5%	0.7%	0.1%	0.0%	0.0%	0.2%	9.4%
All Life Scientists	0.5%	0.7%	4.1%	0.1%	51.7%	9.2%	0.0%	0.1%	0.1%	1.9%	68.5%
All Physical Scientists	1.5%	1.8%	9.8%	0.3%	27.0%	35.4%	0.2%	0.5%	0.0%	2.1%	78.5%
All Science Technicians	0.5%	0.4%	2.8%	0.2%	15.0%	5.1%	0.2%	0.3%	0.0%	0.7%	25.1%
All STEM Managers	12.3%	2.8%	22.4%	1.4%	2.8%	2.4%	0.1%	0.2%	0.1%	0.6%	45.3%
All STEM Occupations	9.9%	2.3%	18.8%	1.1%	5.2%	3.8%	0.1%	0.2%	0.1%	0.7%	42.3%

Derived from: American Community Survey of the Census Bureau, 2009. Data retrieved from IPUMS-USA database.

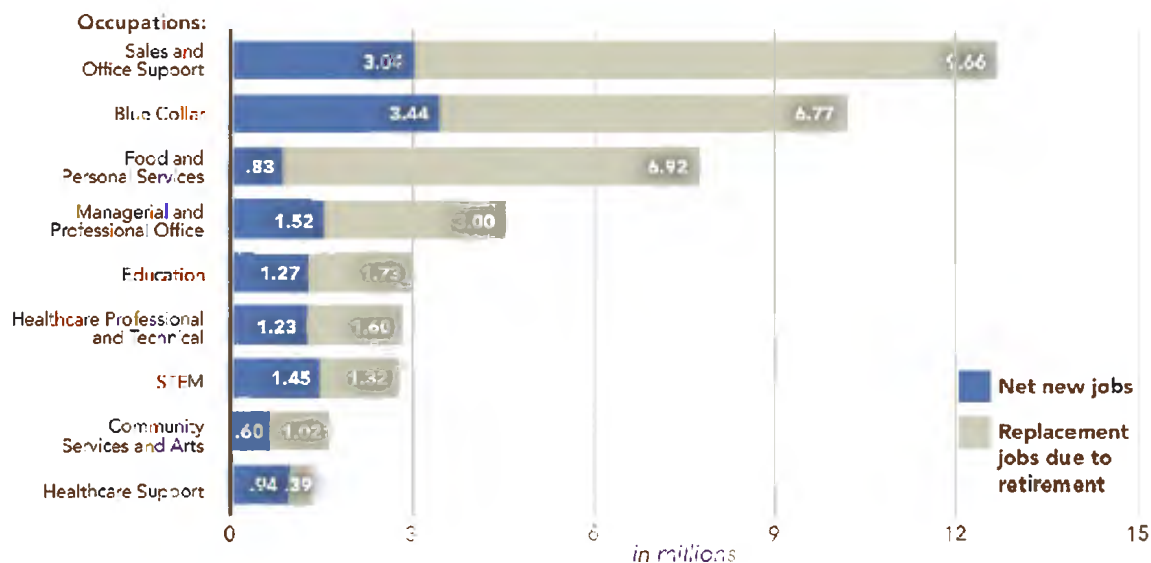
Note: This table excludes social scientists from disciplines and occupations; a complete listing of the columnar degree field groups and the corresponding detailed degree fields is detailed below; occupations follow the CPST conventions of ~50 detailed occupations aggregated into eight groups but excluding those occupations in the social sciences.

Key Points: (Table D-3):

- This table illustrates the difficulty in tracking the STEM workforce due to the number of possible occupational paths that a STEM graduate may take; only the options categorized as STEM occupations are shown here but many more STEM enabled occupations exist.
- Across all education levels, 42.3 percent of individuals in the STEM labor force have a bachelor's degree that was received in a STEM field while 64.4 percent of individuals in the STEM labor force with a bachelor's degree or above received their bachelor's in a STEM field (data not shown).
- Life science occupations have the highest proportion of bachelor's degrees from the identical discipline of life sciences with 51.7% working in the same field they studied. The two groups with the lowest number of workers who have a matching degree and occupational field are engineering technicians and science technicians.
- Of the estimated 11.4 million individuals with STEM bachelor's degrees in the entire workforce in 2009, only 3.3 million or 29.3 percent of them were in STEM occupations.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure D-5. New and Replacement Job Openings and Occupational Distribution

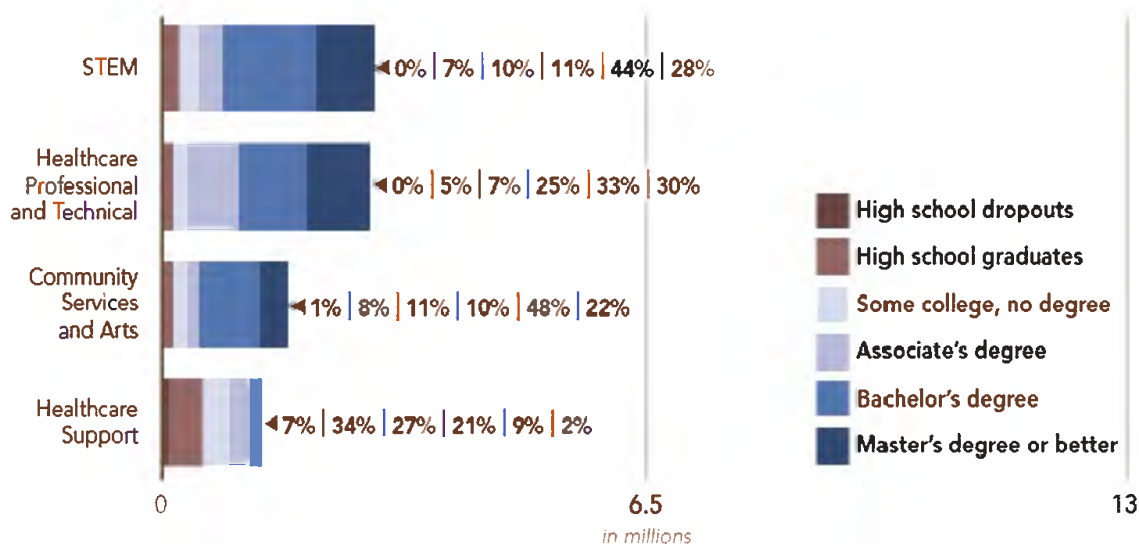


Source: Carnevale, Anthony, Nichole Smith, and Jeff Strohl. (2010). *Help Wanted: Projections of Jobs and Education Requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce, p. 27. Reprinted with permission.

Key Points (Figure D-5):

- Based on Carnevale et al. (2010), net new STEM jobs and STEM replacement jobs due to retirement are projected to be about 2.77 million between 2008 and 2018.

APPENDIX D: ECONOMIC ANALYSIS OF STEM WORKFORCE NEED

Figure D-6. Total Job Openings and the Distribution of Educational Demand within Occupations

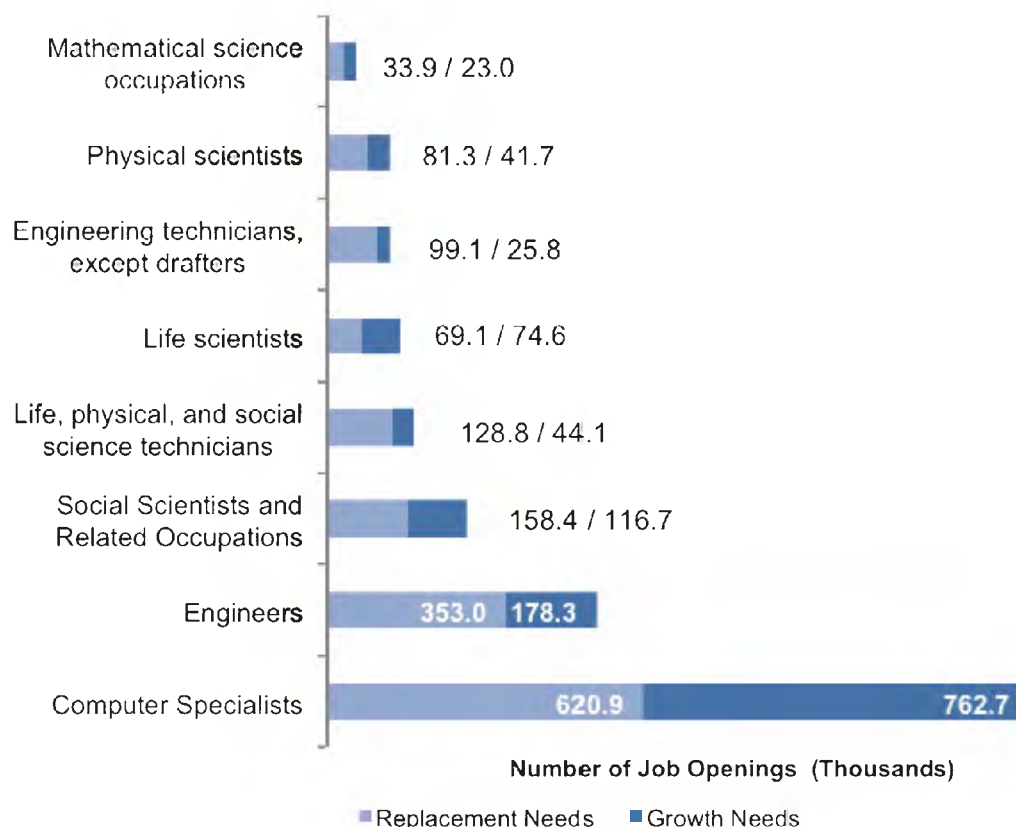
Source: Carnevale, Anthony, Nichole Smith, and Jeff Strohl. (2010). *Help Wanted: Projections of Jobs and Education Requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce, p. 28. Reprinted with permission.

Key Points (Figure D-6):

- 83% of these jobs require an associate's degree or above.
- The projected total number of new and replacement STEM jobs between 2008 and 2018 requiring an associate's degree or above is 2.3 million.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure D-7. Projected Job Openings in STEM Occupations, 2008–2018



Derived from: Bureau of Labor Statistics.

Key Points (Figure D-7):

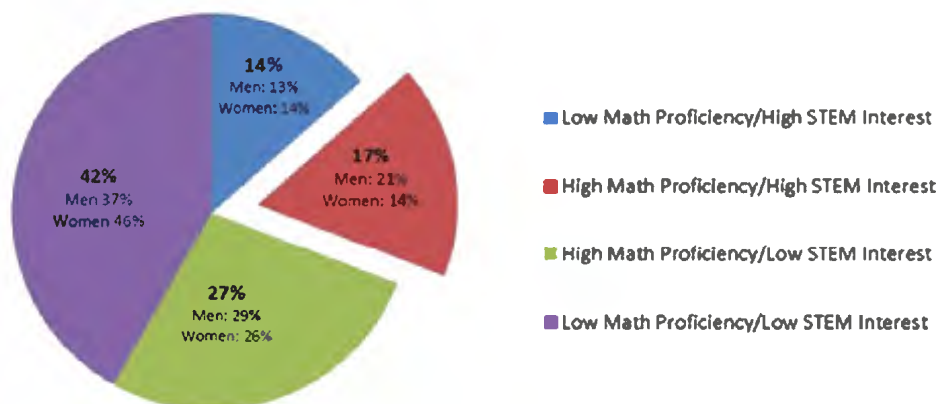
- The number of job openings projected in 2018 is delineated here as growth versus replacement needs. Job growth includes the creation of new jobs while replacement needs are those that result from workers retiring or permanently leaving a position. Together, these categories indicate the minimum number of workers who will need to be trained for the given occupation.
- In terms of total number of job openings, computer specialists are projected to require more than 1.3 million workers as a result of job growth and replacement needs.
- Engineers are the next most required STEM occupation with 531,300 job openings projected through 2018.



Appendix E: Evidence of the Mathematics Preparation Gap

Today, many students enter college not prepared for college level mathematics. Among students who take the ACT entrance examination, just 43 percent achieve the ACT College Readiness Benchmark in mathematics.¹²⁴ Because of inadequate preparation, many students need to take developmental classes in mathematics when they get to college. This poses a burden on students, institutions of higher education, the military, and employers in the form of developmental education and worker training. Higher education alone spends at least two billion dollars on developmental education per year.¹²⁵

Figure E-1. 12th Grade Student STEM Interest and Mathematics Proficiency



Source: The Business-Higher Education Forum. (2011). *The STEM Interest and proficiency challenge: Creating the workforce of the future*. Washington, DC.

Key Points (Figure E-1)

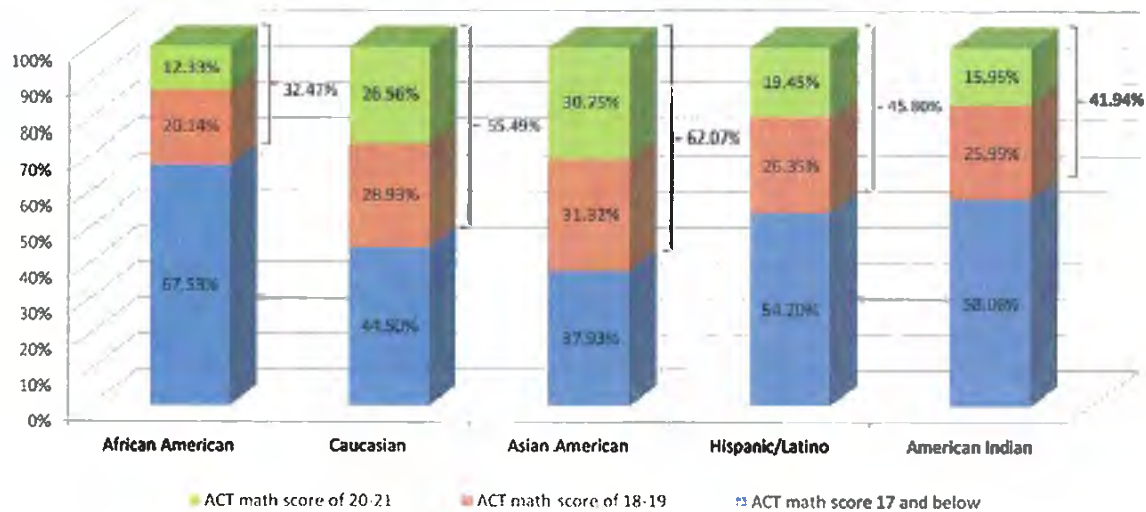
- Among high school seniors who have taken the series of exams offered by the ACT in eighth, tenth, and twelfth grades, about one in six is both proficient in mathematics and interested in STEM fields.
- Closing the mathematics-preparation gap would enable many more students to pursue STEM degrees in college. About 15% of 12th graders are interested in STEM fields but not proficient in math, with women slightly more common in this category (Figure E-1). Furthermore, many members of this group are not far from math proficiency. More than half of white and Asian-American students, more than 40% of Hispanic/Latino and American Indian students, and almost one third of African-American students who are interested in STEM fields are within four points on the ACT exam of the cutoff for math proficiency (Figure E-2). If the preparation of these students in math could be enhanced, many more students could be prepared to pursue STEM fields in college.

124. The benchmarks specify the minimum scores needed on each ACT subject-area test to indicate that a student has a 50 percent chance of earning a grade of B or higher or about a 75 percent chance of earning a C or higher in a typical credit-bearing first-year college course in that subject area. ACT. (2011). *The Condition of College & Career Readiness 2011*. Iowa City, IA: ACT.

125. Strong American Schools. (2008). *Diploma to Nowhere*. Washington, DC.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Figure E-2. High School Student Performance on ACT Math Exam



Source: ACT. (2011). *The Condition of College & Career Readiness 2011*. Iowa City, IA: ACT.

Note: Students who score a 22 or higher on the mathematics portion of the ACT exam are considered math proficient and have a high probability of college success.

Key Points (Figure E-2)

- Large numbers of students who take the ACT exam in twelfth grade, including many students from groups underrepresented in STEM fields, are within a few points on the exam of mathematical proficiency.
- One idea to improve and decrease the high cost of math remediation is to make widespread availability of the resources the Federal government has developed for its use in training the U.S. military (See, for example, Box E-1).

APPENDIX E: EVIDENCE OF THE MATHEMATICS PREPARATION GAP

BOX E-1: USING ARTIFICIAL INTELLIGENCE TO BRIDGE THE MATHEMATICS-PREPARATION GAP

The Office of Naval Research (ONR), the science and technology provider for the U.S. Navy and Marine Corps, has supported academic research in cognitive learning science for more than two decades. For example, the Cognitive Science of Learning program has supported the development of computer-based learning tools, including a 3-D video game developed by ONR, that permit recruits to learn at-sea safety, ship handling, and electronics maintenance during on-shore training. Recruits who use the safety video game make 50 percent fewer errors and locate ship or submarine compartments in 50 percent less time than others. In a study measuring how much information recruits remember, game-playing recruits retained 83 percent of their reading gains, almost four times more than their counterparts.^a

ONR is now developing artificially intelligent STEM tutors to help high school students increase their proficiency in STEM subjects. ONR-sponsored researchers at Arizona State University have demonstrated the success of digital tutors among algebra students, raising student grade levels by up to 20 percent—the equivalent of increasing going from “Cs” to “As.”^b The success of these intelligent tutors has led the Chief of Naval Research to sponsor a multi-million dollar “grand challenge” to adapt the technology for use in STEM education projects.

Sources:

a. Murphy, C. (In Press). *Why Games Work—The Science of Learning*. Modsim World 2011, Virginia Beach, VA, October 2011. Accessible from <http://www.goodgamesbydesign.com/?p=59>.

b. Barrus, A. K. Sabo, S. Joseph, R. Atkinson, and R. Perez. (In Press). *Evaluating Adaptive, Computer-Based Mathematics Tutoring Systems: A Math Improvement Feasibility Study*. Tempe, AZ: Arizona State University.



Appendix F: Efficacy of Various Classroom Methods

Thinking like a scientist requires acquisition of information, habits of mind, skills, and a scientific identity.¹²⁶ It seems unlikely that such diverse attributes would all be learned most effectively through one mode of teaching. Indeed they are not. Yet most introductory STEM courses taken in the first two years of college are in the same format: lectures, followed by practice problem sets, followed by multiple choice or word-problem tests. A single model of instruction cannot achieve all the significant learning goals of science instruction, nor can a single form of assessment detect all the consequential outcomes. To create vibrant science classrooms that effectively transmit knowledge and develop the intellectual attributes of scientists, college faculty must overcome the inertia of the historical habits passed from generation to generation.

A substantial empirical literature demonstrates that alternative models of instruction can achieve many important learning outcomes more effectively than current practice and without added time or cost (for one example, see Box F-1). These studies address learning in many fields of science as well as engineering and math. Many of the alternatives include lectures, but they also include two key elements: (1) Students are actively engaged in the process of learning compared to solely following a lecture and then executing what they have been told; and (2) Students receive feedback while learning, which is usually inherent in activities that engage students' minds.

Two types of studies demonstrate the impact of active learning on comprehension of concepts and retention of information. The first are randomized, controlled studies conducted under experimental laboratory conditions in which students are taught the same material in different ways. One study determined that either writing or talking about material increased comprehension and learning over a control group, and both talking and writing had a more substantial effect on comprehension and also increased long-term retention of knowledge.¹²⁷ Similar studies replicate this effect on humans, and one even suggests that active engagement enhances learning in rhesus monkeys.¹²⁸

The second type of study involves comparison of real classrooms. Because randomized, controlled studies are challenging with real students and teachers, many designs have been used. Some compare student performance in courses that are taught traditionally for many years with the same instructor using the same exams, with the only change the introduction of active exercises.¹²⁹ Others have used parallel sections of the same course,¹³⁰ and others have randomly introduced active learning into some

126. National Research Council. (2005). *How Students Learn: Science in the Classroom*. Washington, DC: National Academy Press.

127. Rivard, L.P. and S.B. Straw. (2000). "The effect of talk and writing on learning science: An exploratory study." *Science Education* 84: 566-593.

128. Kornell, N. and H.S. Terrace. (2007). "The generation effect in monkeys." *Psychological Science* 18(8): 682-685.

129. Woods, D., A. Hrymak, R. Marshall, P. Wood, C. Crowe, and T. Hoffman (1997). "Developing problem solving skills: The McMaster Problem Solving Program." *Journal of Engineering Education*, April, 75-91.

130. Deslauriers, L., E. Schelew, and C. Wieman (2011). "Improved learning in a large-enrollment physics class." *Science* 332(6031): 862-4.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

class sessions and not others within a single course and analyzed student performance on exam questions on topics taught with active or traditional methods.¹³¹ Numerous studies in chemistry, physics, biology, math, and engineering courses show that students learn, perform, and develop higher order thinking skills in active settings better than in passive ones (Table F-2). In almost any research study on humans in real world settings, concern arises that other factors co-vary with the variable of interest. Many studies control for these confounding variables as indicated below (Table F-1). Given the size of the body of peer-reviewed research about active learning; the variation in experimental design among the studies; the diverse settings and subjects used; the consistency of findings across many STEM disciplines; and the concordance between studies of subjects under experimental conditions and studies of real STEM classes, the conclusion is convincing: teaching methods that require active engagement of the mind lead to more learning than does lecturing alone.

Table F-1 Controls for Confounding Variables in Classroom Learning Studies

Confounding Variable	Approach that Avoid this Problem
Better students in the active learning cohort	<ul style="list-style-type: none"> • Randomize the students in the active learning and comparison groups • Use matched groups with similar grades in previous courses
Instructor aims to prove that active learning is more effective	<ul style="list-style-type: none"> • Compare a traditional course taught to one by an outstanding instructor aiming to prove that active methods are <i>not</i> better than lectures alone
Active learning professor “teaches to the exam”	<ul style="list-style-type: none"> • Use standardized national test • Have students interviewed about the course content by a colleague who does not know which students received which treatment and who had not attended either course • Test students’ ability to pose good scientific questions as judged by blind reviewers

The Evidence Summarized

Today, hundreds of papers have documented the scientific evidence regarding effective teaching,¹³² including examples of large studies with robust findings in this field. A meta-analysis of 62 physics courses (14 traditional, 48 active) taught across the U.S. showed that among a total of 6,000 students, performance on a common test was higher among those who were taught with active methods.¹³³ Another study analyzed 39 studies of small-group learning and showed that it enhanced academic performance, attitudes toward learning, and persistence in STEM.¹³⁴ In chemistry, a meta-analysis of controlled studies of high school chemistry, college introductory chemistry, and organic chemistry reported

131. Smith, M.K, W.B. Wood, K. Krauter, and J.K Knight. (2011). “Combining peer discussion with instructor explanation increases student learning from in-class concept questions.” *CBE Life Sciences Education* 10: 55-63.

132. A general survey of promising practices in undergraduate STEM education, with an emphasis on the extent to which the practices have been validated by research, is the white paper “Promising Practices in Undergraduate STEM Education” (2008) by J. E. Froyd. Available at http://www7.nationalacademies.org/bose/Froyd_Promising_Practices_CommissionedPaper.pdf. See also Baldwin, Roger G., ed. (2009). *Improving the Climate for Undergraduate Teaching and Learning in STEM Fields*. San Francisco: Jossey-Bass.

133. Hake, R.R. (1998). “Interactive engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses.” *American Journal of Physics* 66(1): 64.

134. Springer, L., M.E. Stanne, and S.S. Donovan (1999). “Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis.” *Review of Educational Research* 69(1): 21-51.

APPENDIX F: EFFICACY OF VARIOUS CLASSROOM METHODS

that nearly all of 37 studies involving 3,500 students showed statistically significant positive effects of active learning, and the average effect of active learning across all studies would move a student from the 50th percentile to the 70th percentile.¹³⁵ Among the 37 research studies reviewed, 11 also showed improvement of student attitudes toward science and 9 showed an average 22 percent higher retention of students in STEM after an active learning chemistry course than a traditional one.¹³⁶

In the 1990s, many medical schools changed from a traditional style of delivery to problem-based learning in courses for medical students. University of Missouri-Columbia studied the impact of this change on student performance on the national Medical Licensing Examination. They found a significant improvement of scores associated with the change. For example, among the classes in 1995 and 1996, who were taught in the traditional courses, an average of 8 students per year scored in the 90th percentile. In contrast, in 1997-2000, an average of 21 students per year scored in the 90th percentile. Performance improved over time, apparently due to increased faculty experience in teaching with the problem-based style, so that by 2000, 29 students scored in the 90th percentile, representing a greater than three-fold increase compared with the traditional curriculum.¹³⁷ Subsequent studies showed that the students taught by problem-based learning methods received better evaluations from residency directors.¹³⁸

In addition to experimental and classroom data, the enhancement of learning in active settings is supported by neurobiology and common experience. The current understanding of knowledge acquisition, short-term and long-term memory, and brain development indicate that learning changes the brain and that is accomplished by an active process of building neural connections. These are constructed through active processing.

The research indicates that many different types of active engagement can accomplish learning gains. Introduction of clickers into a lecture,¹³⁹ having students solve a problem before attending a lecture,¹⁴⁰ use of group discussion,¹⁴¹ problem-solving,¹⁴² individual writing or "one-minute papers,"¹⁴³ taking a test,¹⁴⁴ conducting an inquiry-based lab,¹⁴⁵ and combinations of these activities all have had significant impacts in improving learning. Therefore, the support for using evidence-based teaching methods

135. Bowen, C.W. (2000). "A quantitative literature review of cooperative learning effects on high school and college chemistry achievement." *Journal of Chemical Education* 77(1): 116.

136. Ibid.

137. Hoffman, K., M. Hosokawa, R. Blake, L. Headrick, and G. Johnson. (2006). "Problem-based learning outcomes: ten years of experience at the University-Columbia School of Medicine." *Academic Medicine: Journal of the Association of American Medical Colleges* 81(7): 617-25.

138. Ibid.

139. Smith, M., W. Wood, W. Adams, C. Wieman, J. Knight, N. Guild. (2009). "Why peer discussion improves student performance in class." *Science* 323: 122-124.

140. Schwartz, D.L. and J.D. Bransford. (1998). "A time for telling." *Cognition and Instruction* 16(4): 475-522.

141. Buck, J.R. and K.E. Wage. (2005). "Active and cooperative learning in signal processing courses." *IEEE Signal Processing Magazine* 22(2): 76-81.

142. Capon, N. and D. Kuhn (2004). "What's so good about problem-based learning." *Cognition and Instruction* 22(1): 61-79.

143. Almer, E., Jones, K., and Moeckel, C. (1998). The impact of one-minute papers on learning in an introductory accounting course. *Issues in Accounting Education* 13(3): 485-495.

144. McDaniel, M., J. Anderson, M. Derbish, and N. Morrisette (2007). "Testing the testing effect in the classroom." *European Journal of Cognitive Psychology* 19(4): 494-513.

145. Brickman, P., C. Gormally, N. Armstrong, and B. Hallar. (2009). "Effects of Inquiry-based Learning on Students' Science Literacy Skills and Confidence." *International Journal for the Scholarship of Teaching and Learning*.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

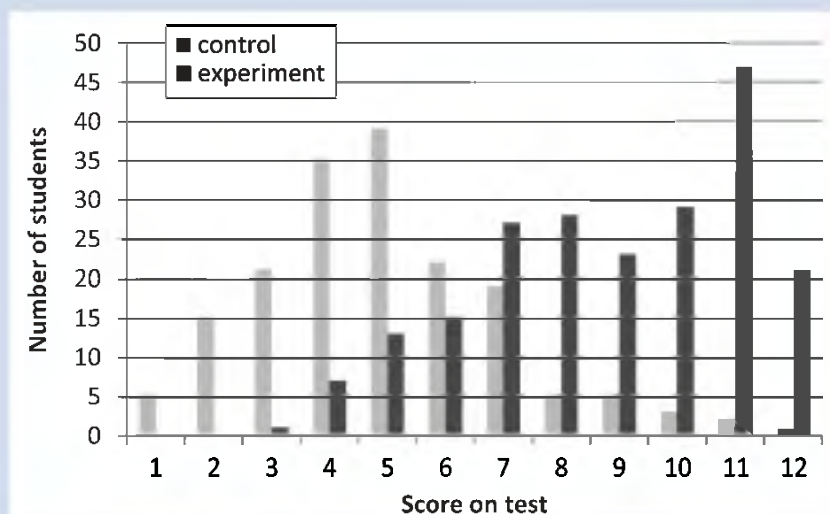
presented in this report is not advancing a single type of teaching. Instead, based on the numerous data points available, we posit that the key change is to bring to STEM classrooms various approaches that truly engage students intellectually and involve thinking, problem-solving, questioning, or analyzing information. Based on the weight and variety of the research evidence, it is reasonable to say that if one active-learning event in which students engaged and received feedback were incorporated into each classroom session of every introductory college class in the United States, science education would likely be transformed.

BOX F-1: ENHANCED LEARNING IN A LARGE PHYSICS CLASS

A recent experiment at the University of British Columbia demonstrated the feasibility of using active learning to greatly enhance student learning in large classes at no additional cost.

In the second term of a first-year Electricity and Magnetism course, one group of students was taught in three hours of lecture by an experienced instructor, while another group received the same material through three hours of interactive learning. Altogether, 267 students heard lectures, while 271 students were taught with a method known as “deliberate practice” based on recent findings in cognitive psychology and physics education. The instructor for the experimental group began by giving students a multiple-choice question on a particular concept. The students discussed the question in small groups and answered electronically, revealing their understanding or lack of understanding of a topic. The instructor took this feedback into account during a discussion of the topic before repeating the process with the next concept. The goal was for students to spend as little time as possible passively listening and as much time as possible making and testing predictions and arguments, solving problems, and critiquing their reasoning and that of others.

In the non-traditional class, attendance grew from 57 to 75 percent, engagement rose from 45 to 85 percent, and the students learned twice as much based on test results as the students in the traditional section (see figure). In the traditional section, attendance and engagement remained unchanged.



In a survey afterwards, 90 percent of students in the experimental group agreed that they enjoyed the interactive teaching technique. The technique did not require additional staff or small or specialized classrooms.

Source: Deslauriers, L., E. Schelew, and C. Wieman. (2011). “Improved learning in a large-enrollment physics class.” *Science* 332: 862-864.”

APPENDIX G: REVIEW OF EVIDENCE THAT RESEARCH EXPERIENCES HAVE IMPACTS ON RETENTION

Appendix G: Review of Evidence that Research Experiences have Impacts on Retention

One way to engage and, therefore, retain students in STEM subjects is to involve them in contemporary, authentic research during the first two years of college (see Box G-1). For example, in a randomized trial at the University of Michigan, students who engaged in research with a professor as sophomores were much less likely to leave science majors than those who did not. Though the numbers of students involved were relatively small, the results were dramatic for all ethnic groups: attrition rates dropping from 20% to 11% for black students, from 14% to 0% for Hispanic students, and from 5.5% to 1.4% for white students.¹⁴⁶ A nationwide assessment of 4,500 students involved in undergraduate research found that the research experience clarified students' interests and increased their confidence.¹⁴⁷ Close to 70% of those surveyed said that their interest in a STEM career increased due to their experience, and about 30% of the students who had never considered earning a PhD now expected to do so. The surveys did not detect significant differences between students based on gender or demographic group. The conclusion of the researchers was that "the inculcation of enthusiasm is the key element—and the earlier the better." Additionally, an intervention of early research experience at UC-Davis showed improved grades across STEM courses and improved retention in STEM majors for students who are given rigorous academic program during their first two years of college, are funded to work in research laboratories during their sophomore year, and are provided personal support and guidance (see Box G-2).

146. Nagda, B. A., S.R. Gregerman, J. Jonides, W. von Hippel, and J.S. Lerner (1998). "Undergraduate student-faculty research partnerships affect student retention." *Review of Higher Education* 22(1), 55-72.

147. Russell, S.H., M.P. Hancock, and J. McCullough. (2007). "Benefits of undergraduate research experience." *Science* 316: 548-9.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

BOX G-1: THE FRESHMAN RESEARCH INITIATIVE AT UT AUSTIN

The Freshman Research Initiative at the University of Texas, Austin, enrolls 25 percent of the freshman class in the College of Natural Sciences in three-semester-long laboratory courses based on faculty research programs. The program offers first-year students the opportunity to do cutting-edge, original, publishable research in chemistry, biochemistry, nanotechnology, molecular biology, physics, astronomy, or computer science.

The faculty member leading the course provides the overall direction for the research. Postdoctoral "Research Educators" (REs) organize the entering students' laboratory work and curricula. Mentoring includes help with presentations, data collection and analysis, and placement after the three-semester "research stream."

Early results suggest that student retention in STEM programs is 30 to 35 percent higher for students in the initiative. The program also has formal ways to help students continue in research in faculty laboratories, research abroad, or industry internships.

A key feature of the Freshman Research Initiative is the autonomy of the REs to work directly with students and shape their experience and motivation. The REs are stakeholders in the initiative's success and make it a hotbed for innovation in teaching.

Source: University of Texas at Austin website: <http://frlcrs.utexas.edu/about-frl>.

BOX G-2: PARTICIPATION IN RESEARCH IMPROVES STEM PERSISTENCE AND PERFORMANCE

The UC-Davis Biology Undergraduate Scholars Program (BUSP) Program is an intensive enrichment program for undergraduate students who have a strong interest in life science fields. BUSP, sponsored by the College of Biological Sciences at UC-Davis, enriches the undergraduate experience by providing exciting and challenging opportunities to learn about and participate in the biological sciences. BUSP students enroll in a specially designed, rigorous academic program during their first two years of college, are funded to work in a biology research laboratory during their sophomore year, and meet regularly with skilled advisers who offer academic guidance and personal support. The Table below summarizes BUSP students' persistence and performance in STEM foundation courses, such as chemistry and calculus, for students of the underrepresented minority (URM) who participated in the BUSP program (URM-BUSP) as compared to students of the underrepresented minority, generally (URM comparison), or white and Asian students.

Persistence and performance in foundation courses by group.					
Group	Total N	Calculus Persistence	Calculus GPA	Chemistry Persistence	Chemistry GPA
URM comparison	1,267	42%	2.69	43%	2.56
URM -BUSP	336	75%	2.94	81%	3.1
White/Asian	5,559	54%	2.89	55%	2.79

Source: Villarejo, M., A. Barlow, D. Kogan, B.D. Vazquez, and J. Sweeney (2008). "Encouraging Minority Undergraduates to Choose Science Careers: Career Paths Survey Results." *CBE-Life Sciences Education* 7(4): 1-16.



Appendix H: Effective Programs to Improve STEM Undergraduate Education

Building STEM Communities

Many programs have proven effective at addressing issues of retention and completion in STEM majors by focusing on building a community of STEM scholars, including the Meyerhoff Scholars Program at the University of Maryland, Baltimore County (see Box H-1), the Science Posse program that is beginning in several universities (see Box H-2), and the Louisiana Science, Technology, Engineering & Mathematics (LA-STEM) Research Scholars Program.¹⁴⁸ Common to all these programs is a mentoring community in which upper-division students work with beginning students to provide guidance and model success; access to research groups early in the undergraduate experience; bridge programs to prepare students for the intellectual content of the first year; and group recognition of the need to succeed in introductory and gateway courses. All of these and similar programs require funding, both for students, many of whom are receiving financial aid, and for the staff members and time needed to create and guide learning communities.

BOX H-1: THE MEYERHOFF SCHOLARS PROGRAM

The Meyerhoff Scholars Program at the University of Maryland, Baltimore County, has been at the forefront of efforts to increase diversity among future leaders in science, engineering, and related fields. Started in 1988, the program now has more than 1,000 alumni. Key components of the program include scholarships contingent on maintaining a B-average in STEM majors, an intensive six-week summer bridge program, a family-like program community, an emphasis on achieving at the highest levels, personal advising and counseling from program staff, summer research internships in national and international laboratories, science mentoring, and support from administrators and faculty.

The nomination-based application process is open to prospective undergraduate students of all backgrounds who plan to pursue doctoral study in the sciences or engineering and who are interested in the advancement of minorities in those fields. The program's success is built on the premise that, among like-minded students who work closely together, positive energy is contagious. By assembling such a high concentration of high-achieving students in a tightly knit learning community, students continually inspire one another to do better.

Among African American students who entered the program between 1996 and 2003, 51% (88 of 172) attended STEM PhD and MD/PhD programs. An additional 40% entered master's programs, particularly in technical fields, or medical school. Many representatives from Federal agencies, campuses, and corporations across the country have visited UMBC's campus to learn more about the program's success. The College Board's National Task Force on Minority High Achievement has praised the Meyerhoff Scholars Program as a model that provides lessons that could be broadly applied.

Source: University of Maryland, Baltimore County website: <http://umbc.edu/meyerhoff/>.

148. See Louisiana Science, Technology, Engineering and Mathematics Research Scholars Program Website: <http://www.lsu.edu/lastem/files/LA-STEM%20flyer%20for%20LSU%20and%20Transfer%20Students%202011.pdf>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Engaging and Preparing Rising College Students

Bridge programs, which are typically offered in the summer between high school graduation and the first term of college, can help prepare entering students for the rigors of college academics and life (see Boxes H-2 and H-3). Typically, high school juniors and seniors live on campus and receive classroom instruction, research experience, career counseling, SAT and ACT preparation, and mentoring from graduate students and faculty. Most of these programs, such as Carnegie Mellon University's Summer Academy for Mathematics and Science and the California State Summer School for Mathematics and Science, are open to high school students on statewide or nationwide basis. Some are aimed at the underrepresented majority to provide incoming students with the intellectual, personal, and social supports they will need to excel.

BOX H-2: A POSSE PROGRAM FOR STEM FIELDS

The Posse Foundation is a successful college access and youth leadership development program. Through creative partnerships between local communities and 39 select colleges and universities, Posse currently recruits, nurtures, and delivers outstanding student leaders from eight urban sites: Atlanta, Boston, Washington D.C., Chicago, Los Angeles, Miami, New Orleans, and New York.

Since its inception, Posse has sent 3,650 students to college, 90 percent of whom have graduated. As one measure of the program's impact on leadership development, over 70 percent of Posse Scholars either start new campus organizations or become presidents of existing ones. A recent survey shows that more than 45 percent of Posse alumni either have completed a graduate degree or are currently in graduate school.

Posse's college access process is noteworthy. Each fall seniors are nominated by high schools and community-based organizations in the eight cities. Posse staff and volunteers evaluate students, looking for leaders with true commitment and potential. Partnering colleges and universities then select ten-student Posses in December of the students' senior year of high school. During the remainder of their senior year, the students participate in weekly sessions with staff trainers and peers who provide scholastic and cultural preparation for college. Once on campus the students are mentored by staff and upperclassmen. The home community supports the recruiting process, and the partner colleges and universities provide four-year scholarships.

Posse recently began a STEM Posse initiative on three campuses based on the proven elements of the original program, with additional components needed for STEM. Thus far Brandeis University, the University of Wisconsin at Madison, and Franklin and Marshall College are admitting STEM Posses. The program identifies students with an interest in STEM and provides extra pre-collegiate training during their senior year, a two-week campus immersion program just prior to matriculation, intensive mentoring in STEM-related areas, and placement in research opportunities throughout the four undergraduate years.

Although highly successful, growth of the program is limited by the financial burden on the participating institutions. The reach of this program could be greatly enhanced by a Federal or other partner cost-sharing program with the schools. Since 75 to 80 percent of the students require financial aid, a 50 percent Federal or other partner contribution to the scholarships would clearly allow more institutions to participate by relieving their financial aid budgets and would target federal financial aid dollars to a group of students with high potential for success.

Source: Posse Foundation website: <http://www.possefoundation.org/>.

APPENDIX H: EFFECTIVE PROGRAMS TO IMPROVE STEM UNDERGRADUATE EDUCATION

BOX H-3: MIT HELPS MINORITY HIGH SCHOOL STUDENTS SUCCEED IN COLLEGE STEM MAJORS

A three-week engineering program for minority high school students at MIT that began in 1974 has evolved into a national model for widening the pipeline of underrepresented college graduates in STEM fields. Today the Minority Introduction To Engineering and Science (MITES) program supports 60 to 80 high school students, annually, in the summer after their junior year. They live in an MIT dormitory for a six-and-one-half week program of academic work, confidence-building, and development of learning-to-learn skills.

Of the 1,765 alumni of the program to date, 34 percent (more than 600 students) have gone on to MIT. Recent MITES alumni have also gone to Harvard University, Stanford University, and other exceptional schools.

The MITES alumni have been found to be consistently strong performers in college. At MIT, the graduation rates of MITES alumni are 12 percentage points higher than the graduation rates of minority students who did not attend MITES. MITES students at MIT also graduate with grade point averages comparable to the majority MIT student population.

Because of its reputation and systematic outreach, the program receives some 500 to 700 applications from around the country, making it more selective than MIT itself. In the summer of 2010, 65 students were selected from 22 states and Puerto Rico. Acceptance includes consideration of a student's status as first generation college and those who lack a family members background in science and engineering.

Upon arrival, students are tested to establish individual benchmarks and to guide course selection. Through evaluation updates, instructors write detailed evaluation of each student's mastery of the subject in relation to his or her benchmark. Students are given many assignments and quizzes but no final exam or final grades. The curriculum uses the cultural context—having students from different minority groups living and working together—to show how cultural diversity and academic achievement can be connected.

The MITES program is entirely scholarship-based. Support comes from dozens of companies and foundations, including 3M Worldwide, Boeing, and the Broad Institute of MIT and Harvard, and from alumni.

Source: Massachusetts Institute of Technology website: <http://web.mit.edu/mites/>.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

Partnerships Between Two-Year Colleges and Four-Year Colleges

Collaborative partnerships between two-year colleges and four-year institutions would provide greater access to and opportunities for advanced STEM education to a growing number of students (see Box H-4).

BOX H-4: ARTICULATION BETWEEN TWO-YEAR AND FOUR-YEAR INSTITUTIONS

A keystone of the applied STEM manufacturing skills certification model at the Lorain County Community College (LCCC) in Cleveland, Ohio, is a unique partnership with four-year institutions. LCCC is the only community college in the state that offers a program enabling individuals to earn Bachelor's and Master's degrees from any of eight Ohio universities without leaving the LCCC campus.

The University Partnership program facilitates seamless, STEM-related education and career pathways for students completing manufacturing-based programs at the Associate's- and applied science- level. Programs articulate with a variety of Bachelor's of Science degrees in engineering and engineering technology for students who want to pursue additional levels of higher education.

As part of the industry certification initiative, college leaders launched a review of the curriculum's alignment with industry requirements. Faculty identified new or revised content to address skill requirements. The Manufacturing Advocacy and Growth Network (MAGNET), an employer-led organization, held employer meetings to validate the certification pathways and discuss embedded skills, including both applied STEM and critical "soft" skills. The University Partnership at LCCC enables students to gain the depth and breadth of applied STEM skills required to spur innovation and creativity in the modern workplace.

Source: Lorain County Community College website: <http://www.lorainccc.edu/up>.

APPENDIX H: EFFECTIVE PROGRAMS TO IMPROVE STEM UNDERGRADUATE EDUCATION

Partnerships Between Minority-Serving Institutions and Other Colleges and Universities

Minority-serving institutions (MSIs) can serve as key intermediaries to improve the numbers, preparation, and diversity of students interested in STEM fields.¹⁴⁹ Collaborative efforts between MSIs and other colleges and universities could greatly improve educational experiences in STEM disciplines (see Box H-5).

BOX H-5: A SUCCESSFUL PARTNERSHIP BETWEEN A HISTORICALLY BLACK TEACHING-FOCUSED COLLEGE AND A RESEARCH UNIVERSITY

Institutional collaborations that benefit both partners are exemplified by the joint endeavor developed by the University of New Hampshire (UNH) and Elizabeth City State University (ECSU), which are a research university and a teaching-focused historically black institution, respectively. The goal of the partnership was to expand the interest and success of students from underrepresented groups entering STEM careers through expanded scientific knowledge and enhanced educational opportunities.

The collaboration involved exchanges of students and faculty, development of new courses, co-teaching, and joint faculty meetings and presentations. Specific outcomes were providing UNH students with a more diverse educational environment, ECSU students with access to research labs, and both campuses with Federal support for improved STEM research and education.

The collaboration has delineated a set of best practices that could be useful to other alliances, including:

- Institutional commitment and faculty engagement
- Mutual respect and shared time commitments
- An engaged leader
- Critical change agents
- Initiation of difficult dialogues
- Preparing for growth and evolution

Source: Williams, J.E., C. Wake, E. Abrams, G. Hurtt, B. Rock, K. Graham, S. Hale, L. Hayden, W. Porter, R. Blackmon, M. LeCompte, and D. Johnson. (2011). "Building a model of collaboration between historically black and historically white universities." *Journal of Higher Education Outreach and Engagement* 15(2): 35-56.

149. Cullinane, J. and L.H. Leegwater (2009). *Diversifying the STEM Pipeline: The Model Replication Institutions Program*. Washington, DC: Institute for Higher Education Policy.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Partnerships Between Higher Education and Business

Some U.S. businesses have found effective ways to partner to enhance STEM education and career-readiness in high schools, colleges, and universities (see Boxes H-6 and H-7). Involvement of the private sector in training of the future workforce can provide motivation and confidence for students in their ability to perform a STEM-capable job, enhanced training and useful experience, and career readiness.

BOX H-6: EMT SUMMER ACADEMY

Foothill College in Los Altos Hills, CA, offers an accelerated Emergency Medical Technician (EMT) Summer Academy in partnership with the Silicon Valley Community Collaborative (SVCC), the Central County Occupational Center (CCOC), and the San Jose Job Corps. The EMT Academy is presented as a stepping stone for students' advancement in allied health and medical careers. In addition to meeting labor force needs, this program is designed to serve as a model for increasing the retention of underrepresented students in community colleges, particularly in STEM-related fields.

The central components of the program include EMT certification, career and college counseling, tutoring, supported transition to EMT employment and/or college programs, removal of barriers in navigating institutional bureaucracy, and implementation of engagement strategies.

Source: Foothill College website: <http://www.foothill.edu/bio/programs/emt/>.

APPENDIX I: REFERENCES FOR TABLES 2, 3, AND 4

BOX H-7: HARRISBURG UNIVERSITY FOR SCIENCE AND TECHNOLOGY

In Harrisburg, Pennsylvania, a postsecondary institution is helping students who leave high school without good preparation become marketable in STEM fields. The Harrisburg University for Science and Technology (HU), which has grown from 100 to 722 students since 2005, is a private university with the mission of readying the central Pennsylvania workforce for 21st century jobs.

Just 12 percent of residents in the Harrisburg area have a college degree, and area colleges are under producing STEM degrees as compared with similar regions. As manufacturing companies have closed, the local economy needs more skilled STEM workers to revive.

The HU academic format is interdisciplinary, without departments or tenure. Courses are organized around learning objectives, and corporate partners advise on course design. Communication and teamwork are stressed throughout the curriculum.

Two thirds of the students are adults, many sponsored by their employers. All students are coached on life issues such as time management and juggling family and careers. An executive search firm helps new students define career paths, and each has a business mentor. Each student builds an “e-portfolio” that includes performance, comments from faculty, and measures of civic engagement.

Of its original 100 students, 92 were hired into the fields they studied, with salaries of \$50,000 to \$60,000 per year, according to Mel Schiavelli, President of HU. Another striking result is that employers of 18-22 year old students say they do not have to spend 12 to 18 months teaching their new hires how to fit into corporate culture. The students were already mentored through internships and academic-year projects based on workplace needs.

Besides helping students and employers HU is helping to revive downtown Harrisburg, with a new building and dormitory and \$30 million in annual economic impact.

Source: Based on PCAST Working Group on Undergraduate STEM education discussions with Mel Shiavelli, President, Harrisburg University for Science and Technology, May 2011, and data from Harrisburg University of Science and Technology website.



Appendix I: References for Tables 2, 3, and 4

References for Table 2.

- Almer, E., K. Jones, and C. Moeckel. (1998). "The impact of one-minute papers on learning in an introductory accounting course." *Issues in Accounting Education* 13(3): 485-495.
- Anderson, W. L., Mitchell, S. M., and M.P. Osgood. (2005). "Comparison of student performance in cooperative learning and traditional lecture-based biochemistry classes." *Biochemistry and molecular biology education: A bimonthly publication of the International Union of Biochemistry and Molecular Biology* 33(6): 387-93.
- Armbruster, P., M. Patel, E. Johnson, and M. Weiss. (2009). "Active learning and student-centered pedagogy improve student attitudes and performance in introductory biology." *Education* 8: 203-213.
- Armstrong, N., S. Chang, and M. Brickman. (2007). "Cooperative learning in industrial-sized biology classes." *Education* 6: 163-171.
- Beichner, R. J., J.M. Saul, D.S. Abbott, J.J. Morse, D.L. Deardorff, R. J. Allain, et al. (2007). "The student-centered activities for large enrollment undergraduate programs (SCALE-UP) project." In E. F. Redish & P. J. Cooney (Eds.), *Research-Based Reform of University Physics*. College Park, MD: American Association of Physics Teachers.
- Born, W. K., W. Reville, and L.H. Pinto. (2002). "Improving biology performance with workshop groups." *Science Education* 11(4): 347.
- Buckley, M., H. Kershner, K. Schindler, C. Alphonse, and J. Braswell. (2004). "Benefits of using socially-relevant projects in computer science and engineering education." *SIGCSE '04: Proceedings of the 35th SIGCSE Technical Symposium on Computer Science Education* 36(1): 482-486.
- Capon, N. and D. Kuhn. (2004). "What's so good about problem-based learning?" *Cognition and Instruction* 22(1): 61-79.
- Chizmar, J. F. and A.L. Ostrosky. (1998). "The one-minute paper: Some empirical findings." *The Journal of Economic Education* 29(1):3.
- Cortright, R. N., H.L. Collins, D.W. Rodenbaugh, and S.E. DiCarlo. (2003). "Student retention of course content is improved by collaborative-group testing." *AJP: Advances in Physiology Education* 27(3): 102-108.
- Cortright, R. N., H.L. Collins, and S.E. DiCarlo. (2005). "Peer instruction enhanced meaningful learning: ability to solve novel problems." *Advances in Physiology Education* 29(2): 107-111.
- Crouch, C. H., and Mazur, E. (2001). "Peer Instruction: Ten years of experience and results." *American Journal of Physics* 69(9): 970.
- Fagen, A. P. (2002). "Peer instruction: results from a range of classrooms." *The Physics Teacher* 40(4): 206.

**ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS**

- Fonseca, A. P., C.I. Extremina, and A.F. Fonseca. (2004). "Concept mapping: A strategy for meaningful learning in medical microbiology." *First International Conference on Concept Mapping*. Pamplona, Spain.
- Freeman, S., E. O. Connor, J.W. Parks, M. Cunningham, D. Hurley, D. Haak, C. Dirks, and M.P. Wenderoth. (2007). "Prescribed active learning increases performance in introductory biology." *Education* 6:132-139.
- Harris, M. A., R.F. Peck, S. Colton, J. Morris, E.C. Neto, and J. Kallio. (2009). "A combination of hand-held models and computer imaging programs helps students answer oral questions about molecular structure and function: A controlled investigation of student learning." *CBE—Life Sciences Education* 8(1): 29-43.
- Klappa, P. (2009). "Promoting active learning through "pub quizzes"— a case study at the University of Kent." *Evaluation* 14 (December), Article C2.
- Lasry, N., E. Mazur, and J. Watkins. (2008). "Peer instruction: From Harvard to the two-year college." *American Journal of Physics* 76(11): 1066.
- Lewis, S. E. and J.E. Lewis. (2005). "Departing from lectures: An evaluation of a peer-led guided inquiry alternative." *Journal of Chemical Education* 82(1): 135.
- McDaniel, C. N., B.C. Lister, M.H. Hanna, and H. Roy. (2007). "Increased learning observed in redesigned introductory biology course that employed web-enhanced, interactive pedagogy." *CBE—Life Sciences Education* 6: 243-249.
- McDaniel, M., H. Roediger, and K. McDermott. (2007). "Generalizing test-enhanced learning from the laboratory to the classroom." *Psychonomic Bulletin & Review* 14(2): 200-206.
- O' Sullivan, D. W. and C.L. Cooper. (2003). "Evaluating active learning: A new initiative for a general chemistry curriculum." *Journal of College Science Teaching* 32(7): 448-453.
- Pelaez, N. J. (2002). "Problem-based writing with peer review improves academic performance in physiology." *Advances in Physiology Education* 26(3): 174-184.
- Preszler, R. (2004). "Cooperative concept mapping: Improving performance in undergraduate biology." *Journal of College Science Teaching* 33(6): 30-35.
- Preszler, R. W., A. Dawe, and C.B. Shuster. (2007). "Assessment of the Effects of Student Response Systems on Student Learning and Attitudes over a Broad Range of Biology Courses." *CBE—Life Sciences Education* 6(1): 29 - 41.
- Preszler, R. W. (2009). "Replacing lecture with peer-led workshops improves student learning." *CBE—Life Sciences Education* 8: 182-192.
- Rivard, L.P. and S.B. Straw. (2000). "The effect of talk and writing on learning science: An exploratory study." *Science Education* 84: 566-593.
- Schwartz, D. L. and J.D. Bransford (1998). "A time for telling." *Cognition & Instruction* 16: 475-522.

APPENDIX I: REFERENCES FOR TABLES 2, 3, AND 4

- Smith, M., W. Wood, W. Adams, C. Wieman, J. Knight, N. Guild, et al. (2009). "Why peer discussion improves student performance on in-class concept questions." *Science* 323: 122-124.
- Smith, M.K., W.B. Wood, K. Krauter, and J.K. Knight. (2011) "Combining Peer Discussion with Instructor Explanation Increases Student Learning from In-Class Concept Questions." *CBE—Life Sciences Education* 10: 55-63.
- Steele, J. E. (2003). "Effect of essay-style lecture quizzes on student performance on anatomy and physiology exams." *Bioscene: Journal of College Biology Teaching* 29(4): 15-20.
- Tessier, J. (2004). "Using peer teaching to promote learning in biology." *Journal of College Science Teaching* 33(6): 16-19.
- Tessier, J. (2007). "Small-group peer teaching in an introductory biology classroom." *Journal of College Science Teaching* 36(4): 64-69.
- Tien, L.T., V. Roth, and J.A. Kampmeier. (2002). "Implementation of a peer-led team learning instructional approach in an undergraduate organic chemistry course." *Journal of Research in Science Teaching* 39(7): 606-632.
- Traver, H. A., M.J. Kalsher, J.J. Diwan, and J. Warden. (2001). "Student reactions and learning: Evaluation of a biochemistry course that uses web technology and student collaboration." *Biochemistry and Molecular Biology Education* 29: 50-53.
- Yarden, H., G. Marbach-ad, and J.M. Gershoni. (2004). "Using the concept map technique in teaching introductory cell biology to college freshmen." *Bioscene: Journal of College Biology Teaching* 30(1): 3-13.

References for Table 3.

- American Association for the Advancement of Science. (2011). "Vision and Change in Undergraduate Science Education: A View for the 21st Century." Washington, DC.
- Austin, A. E., M.R. Connolly, and C.L. Colbeck (2008). "Strategies for Preparing Integrated Faculty: The Center for the Integration of Research, Teaching, and Learning." *New Directions for Teaching and Learning* 113: 69-81.
- Barlow, A. and M. R. Villarejo (2004). "Making a difference for minorities: Evaluation of an educational enrichment program." *Journal of Research in Science Teaching* 41(9): 861-881.
- Bartlett, K. (2003). "Towards a true community of scholars: Undergraduate research in the modern university." *Journal of Molecular Structure: THEOCHEM* 666-667: 707-711.
- Beatty, I. D. (2004). "Transforming student learning with classroom communication systems." *Educause Center for Applied Research: Research Bulletin* 2004(3): 1-13.
- Bouwma-Gearhart, J. L., S.B. Millar, S.S. Barger, and M.R. Connolly (2007). "Doctoral and Postdoctoral STEM Teaching-related Professional Development: Effects on the Early Career." *American Educational Research Association Annual Meeting*.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

- Burstyn, J., S. Sellers, A. Cabrera, K. Freidrich, and L. Giovanetto. (2006). "Resources for Inclusive Teaching in Science, Technology, Engineering and Mathematics." CIRTl Diversity Institute Literature Review. Accessible at <http://www.cirtl.net/bibliography>.
- Caldwell, J. E. (2007). "Clickers in the Large Classroom: Current Research and Best-Practice Tips." *CBE—Life Sciences Education* 6(1): 9-20.
- Campbell, S. P., A. K. Fuller, and D.A.G. Patrick. (2005). "Looking beyond research in doctoral education." *Frontiers in Ecology and the Environment* 3(3): 153-160.
- Carter, F. D., M. Mandell, and K.I. Maton. (2009). "The Influence of On-Campus, Academic Year Undergraduate Research on STEM Ph.D. Outcomes: Evidence From the Meyerhoff Scholarship Program." *Educational Evaluation and Policy Analysis* 31(4): 441-462.
- Connolly, M. R. (2008). "Effects of a Future-Faculty Professional Development Program on Doctoral Students and Postdocs in Science, Technology, Engineering and Math: Findings from a Three-year Longitudinal Study." *Presented at conference on Preparing for Academic Practice: Disciplinary Perspectives*. Oxford, England.
- Donofrio, L. A., B. Russell, et al. (2007). "Mentoring. Linking student interests to science curricula." *Science* 318(5858): 1872-1873.
- Felder, R. M., A. Rugarcia, and J.E. Stice. (2000). "The future of engineering education: Assessing teaching effectiveness and educational scholarship." *Chemical Engineering Education* 34(3): 198-207.
- Gainen, J. (1995). "Barriers to success in quantitative gatekeeper courses." *New Directions for Teaching and Learning* 61: 5-14.
- Gilmer, T. C. (2007). "An Understanding of the Improved Grades, Retention and Graduation Rates of STEM Majors at the Academic Investment in Math and Science (AIMS) Program of Bowling Green State University (BGSU)." *Higher Education* 8: 11-21.
- Haak, D. C., J. HilleRisLambers, E. Pitre, and S. Freeman. (2011). "Increased Structure and Active Learning Reduce the Achievement Gap in Introductory Biology." *Science* 332: 1213-1216.
- Hathaway, R., B.A. Nagda, and S. Gregerman. (2002). "The relationship of undergraduate research participation to graduate and professional education pursuit: An empirical study." *Journal of College Student Development* 43(5): 614-631.
- Haudek, K. C., J. J. Kaplan, et al. (2011). "Harnessing Technology to Improve Formative Assessment of Student Conceptions in STEM: Forging a National Network." *CBE—Life Sciences Education* 10(2): 149-155.
- Hunter, A-B., S. L. Laursen, and E. Seymour. (2007). "Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development." *Science Education* 91: 36-74.
- Kight, S.L., J.J. Gaynor, and S.D. Adams. (2006). "Undergraduate Research Communities: A Powerful Approach to Research Training." *Journal of College Science Teaching* July/August, 34-39.

APPENDIX I: REFERENCES FOR TABLES 2, 3, AND 4

- Kinkel, D. H. and S. E. Henke. (2006). "Impact of undergraduate research on academic performance, educational planning, and career development." *Journal of Natural Resources and Life Sciences Education* 35: 194-201.
- Lockwood, P. (2006). "Someone like me can be successful: Do college students need same-gender role models?" *Psychology of Women Quarterly* 30(1): 36-46.
- Lopatto, D., C. Alvarez, et al. (2008). "Undergraduate research. Genomics Education Partnership." *Science* 322(5902): 684-685.
- May, G. S. and D. E. Chubin (2003). "A retrospective on undergraduate engineering success for underrepresented minority students." *Journal of Engineering Education* 92(1): 33.
- Miller, S., C. Pfund, C. Maidle Pribbenow, and J. Handelsman. (2008). "Scientific Teaching in Practice." *Science* 322: 1329-1330.
- Muller, C. B. (1997). "The potential of industrial 'E-Mentoring' as a retention strategy for women in science and engineering." *Frontiers in Education Conference 1997 - 27th Annual Conference, Teaching and Learning in an Era of Change*. Proceedings 2: 622-626.
- Ong, A. D., J. S. Phinney, et al. (2006). "Competence under challenge: Exploring the protective influence of parental support and ethnic identity in Latino college students." *Journal of Adolescence* 29(6): 961-979.
- Ovando, M. N. (1994). "Constructive Feedback: A Key to Successful Teaching and Learning." *International Journal of Educational Management* 8(6): 19 - 22.
- Peckham, J., P. Stephenson, J-Y Hervé, R. Hutt, and Miguel Encarnação. (2007). "Increasing student retention in computer science through research programs for undergraduates." *SIGCSE '07: Proceedings of the 38th SIGCSE Technical Symposium on Computer Science Education* 39(1): 124-128.
- Pfund, C., S. Miller, K. Brenner, P. Bruns, A. Chang, D. Ebert-May, A.P Fagen, J. Gentile, S. Gossens, I.M. Khan, J.B. Labov, C.M. Pribbenow, M. Susman, L. Tong, R.Wright, R.T. Yuan, W.B. Wood, and J. Handelsman, J. (2009). "Summer Institute to Improve University Science Teaching." *Science* 324: 470-471.
- Rodriguez, A. L., F. Guido-DiBrito, V. Torres, and D. Talbot. (2000). "Latina College Students: Issues and Challenges for the 21st Century." *NASPA Journal* 37(Spring 2000).
- Russell, S. H., M.P. Hancock, and J. McCullough (2007). "The pipeline. Benefits of undergraduate research experiences." *Science* 316(5824): 548-9.
- Shaffer, C. D., C. Alvarez, et al. (2010). "The Genomics Education Partnership: Successful Integration of Research into Laboratory Classes at a Diverse Group of Undergraduate Institutions." *CBE—Life Sciences Education* 9(1): 55-69.
- Springer, L., M. E. Stanne, and S.S. Donovan. (1999). "Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis." *Review of Educational Research* 69(1): 21-51.

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES
WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

- Stout, J. G. D., Nilanjana; Hunsinger, Matthew; McManus, Melissa A. (2011). "STEMing the tide: Using ingroup experts to inoculate women's self-concept in science, technology, engineering, and mathematics (STEM)." *Journal of Personality and Social Psychology* 100: 255-270.
- Summers, M. F. and F. A. Hrabowski (2006). "Preparing Minority Scientists and Engineers." *Science* 311(5769): 1870-1871.
- Sy, S. R. a. R., J. (2008). "Family Responsibilities Among Latina College Students From Immigrant Families." *Journal of Hispanic Higher Education* 7(3): 212-227.
- Turner, P., L. Petzold, A. Shiflet, I. Vakalis, K. Jordan, and S. St. John. (2011). "Undergraduate Computational Science and Engineering Education." *Society for Industrial and Applied Mathematics Review* 53(3): 561-574.
- University of Texas, Austin. (2011). Course Transformation Site from http://www.utexas.edu/academic/ctp/resources/literature-review/#instructional_dev_tech.
- Walton, G. M. and G. L. Cohen. (2011). "A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students." *Science* 331(6023): 1447-1451.
- Wei, C. A. and T. Woodin. (2011). "Undergraduate Research Experiences in Biology: Alternatives to the Apprenticeship Model." *CBE—Life Sciences Education* 10(2): 123-131.
- Wild, L. and L. Ebberts. (2002). "Rethinking student retention in community colleges." *Community College Journal of Research and Practice* 26: 503- 519.
- Yoon, K. S., T. Duncan, et al. (2007). "Reviewing the evidence on how teacher professional development affects student achievement." *Issues & Answers Report, REL, Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest*. 2007 (033).

References for Table 4.

- Barlow, A. and M. R. Villarejo (2004). "Making a difference for minorities: Evaluation of an educational enrichment program." *Journal of Research in Science Teaching* 00: 1-2.
- Carter, F. D., M. Mandell, and K.I. Maton. (2009). "The Influence of On-Campus, Academic Year Undergraduate Research on STEM Ph.D. Outcomes: Evidence From the Meyerhoff Scholarship Program." *Educational Evaluation and Policy Analysis* 31(4): 441-462.
- Foertsch, J. A., B. B. Alexander, and D.L. Penberthy. (1997). "Evaluation of UW-Madison's summer undergraduate research programs (final report)." Madison, WI: University of Wisconsin-Madison, LEAD Center.
- Gilmer, T. C. (2007). "An Understanding of the Improved Grades, Retention and Graduation Rates of STEM Majors at the Academic Investment in Math and Science (AIMS) Program of Bowling Green State University (BGSU)." *Higher Education* 8: 11-21.

APPENDIX I: REFERENCES FOR TABLES 2, 3, AND 4

- Hathaway, R., B.A. Nagda, and S. Gregerman. (2002). "The relationship of undergraduate research participation to graduate and professional education pursuit: An empirical study." *Journal of College Student Development* 43(5): 614-631.
- Hunter, A-B., S. L. Laursen, and E. Seymour. (2007). "Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development." *Science Education* 91: 36-74.
- Junge, B., C. Quiñones, J. Kakietek, D. Teodorescu, and P. Marsteller. (2010). "Promoting Undergraduate Interest, Preparedness, and Professional Pursuit in the Sciences: An Outcomes Evaluation of the SURE Program at Emory University." *CBE—Life Sciences Education* 9(2): 119-132.
- Kight, S.L., J.J. Gaynor, and S.D. Adams. (2006). "Undergraduate Research Communities: A Powerful Approach to Research Training." *Journal of College Science Teaching* July/August, 34-39.
- Kinkel, D. H. and S. E. Henke. (2006). "Impact of undergraduate research on academic performance, educational planning, and career development." *Journal of Natural Resources and Life Sciences Education* 35: 194-201.
- Lopatto, D. (2004). "Survey of Undergraduate Research Experiences (SURE): first findings." *Cell Biology Education* 3(4): 270-277.
- Lopatto, D. (2007). "Undergraduate research experiences support science career decisions and active learning." *CBE—Life Sciences Education* 6: 297-306.
- Russell, S. H., M.P. Hancock, and J. McCullough. (2007). "The pipeline. Benefits of undergraduate research experiences." *Science* 316(5824): 548-9.
- Summers, M. F. and F. A. Hrabowski. (2006). "Preparing Minority Scientists and Engineers." *Science* 311(5769): 1870-1871.



President's Council of Advisors
on Science and Technology (PCAST)

www.whitehouse.gov/ostp/pcast

EXHIBIT 28



**Job Openings and Labor Turnover Survey
Highlights
August 2017**

**Bureau of Labor Statistics
October 11, 2017**

Chart 1. Number of unemployed persons per job opening
Seasonally adjusted

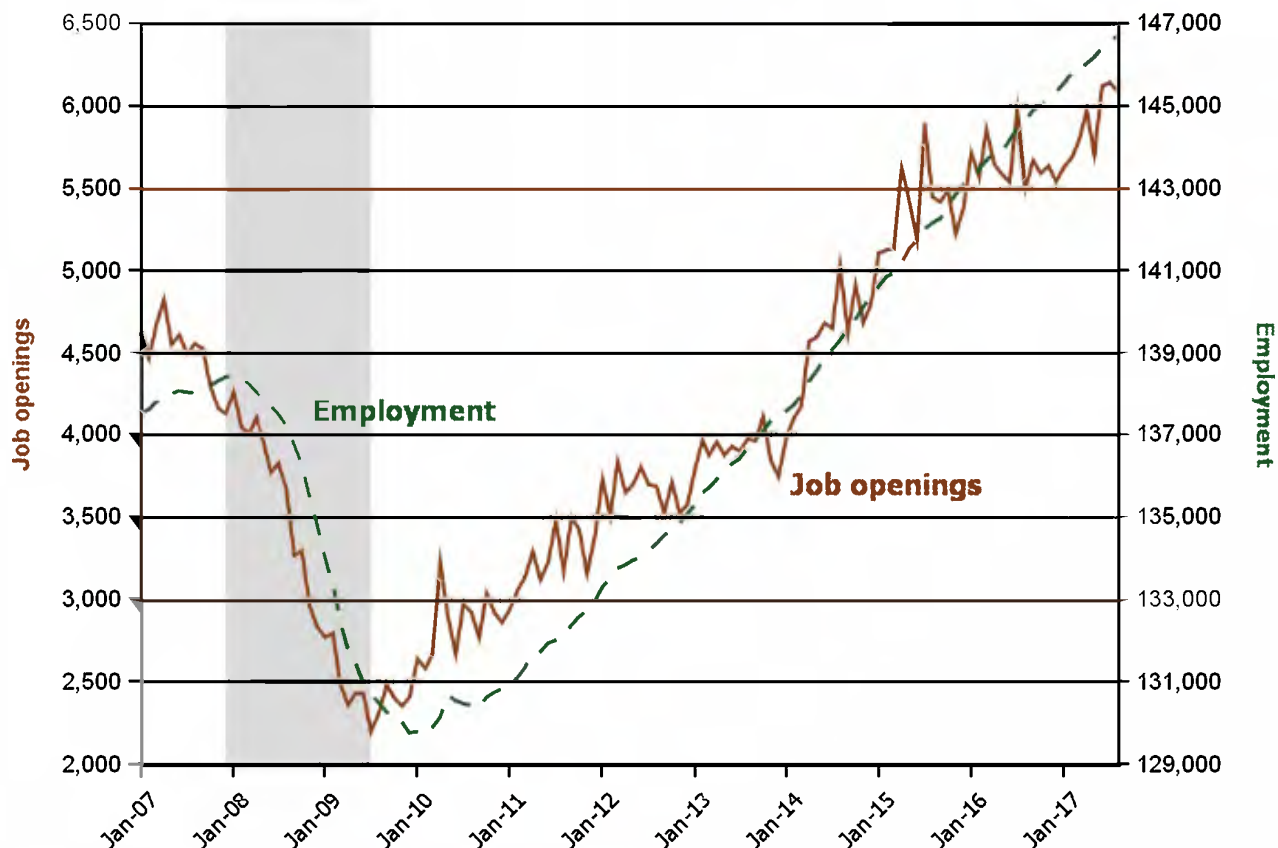


Source: Bureau of Labor Statistics, Current Population Survey and Job Openings and Labor Turnover Survey, October 11, 2017.

Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

- The ratio of unemployed persons per job opening varies with the business cycle.
- When the most recent recession began (December 2007), the ratio of unemployed persons per job opening was 1.9. The ratio peaked at 6.6 unemployed persons per job opening in July 2009 and trended downward until the end of 2015 and again in 2017, reaching historic lows.
- The ratio of unemployed persons per job opening was 1.2 in August 2017.

Chart 2. Job openings and employment
Seasonally adjusted, in thousands

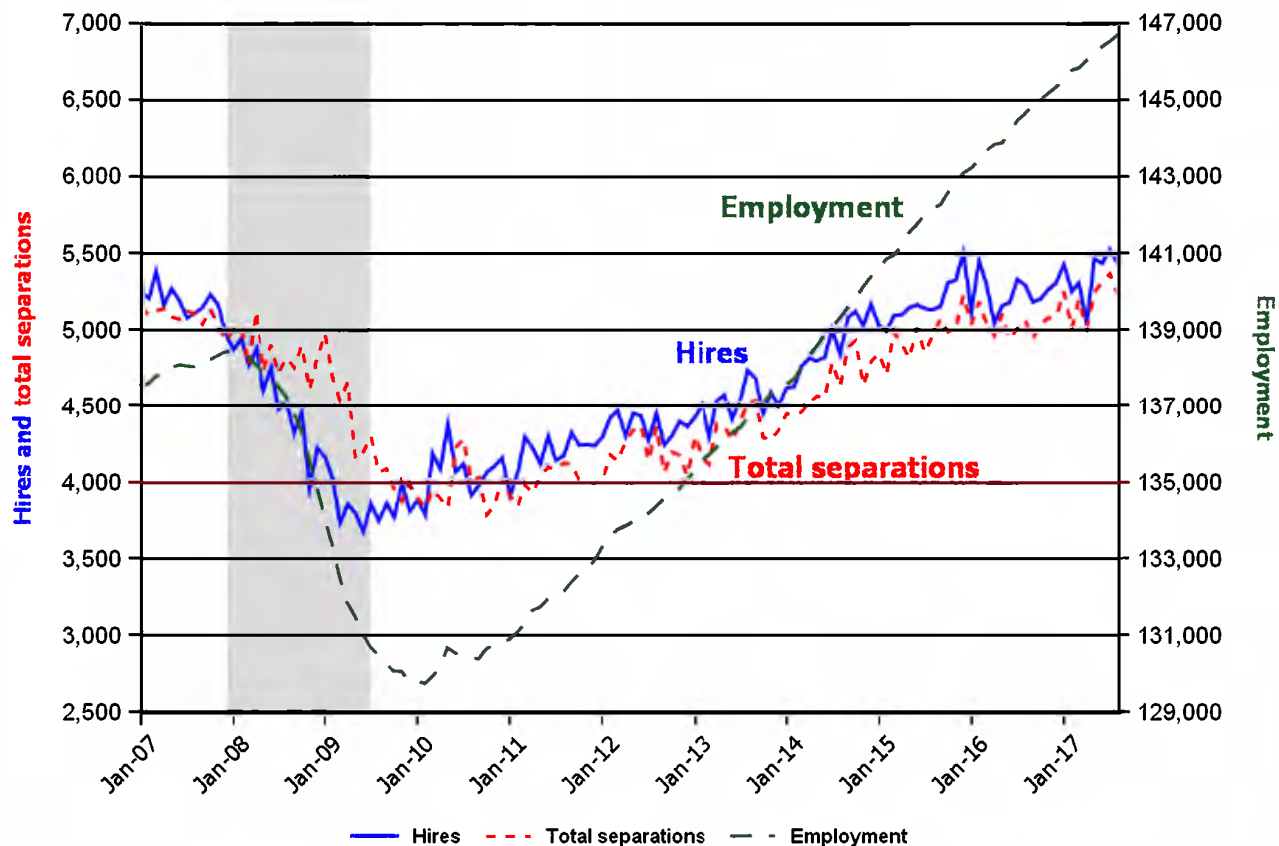


Source: Bureau of Labor Statistics, Current Employment Statistics and Job Openings and Labor Turnover Survey, October 11, 2017.

Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

- The number of job openings declined to a series low in July 2009, one month after the official end of the most recent recession. Employment continued to decline after the end of the recession, reaching a low point in February 2010.
- Employment has trended upward since the low in February 2010 and passed the January 2008 peak in May 2014.
- Job openings have trended upward since a series low in July 2009 with occasional flat periods such as early to mid 2013 and late 2016. They surpassed the April 2007 prerecession peak in August 2014. In August 2017, there were 6.1 million job openings.

Chart 3. Hires, total separations, and employment
Seasonally adjusted, in thousands

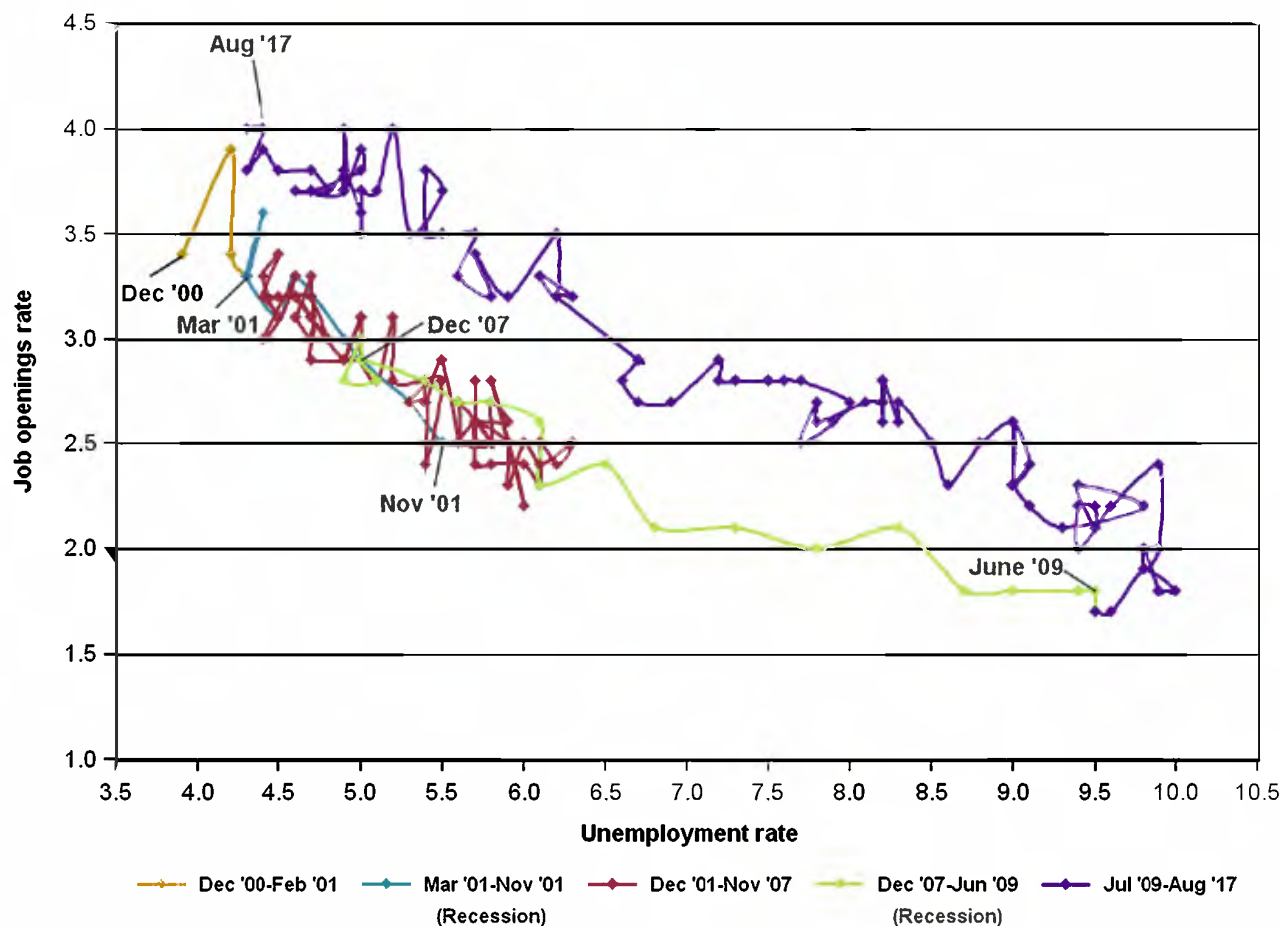


Source: Bureau of Labor Statistics, Current Employment Statistics and Job Openings and Labor Turnover Survey, October 11, 2017.

Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

- In August 2017, there were 5.4 million hires and 5.2 million total separations.
- Both hires and total separations have surpassed prerecession levels.

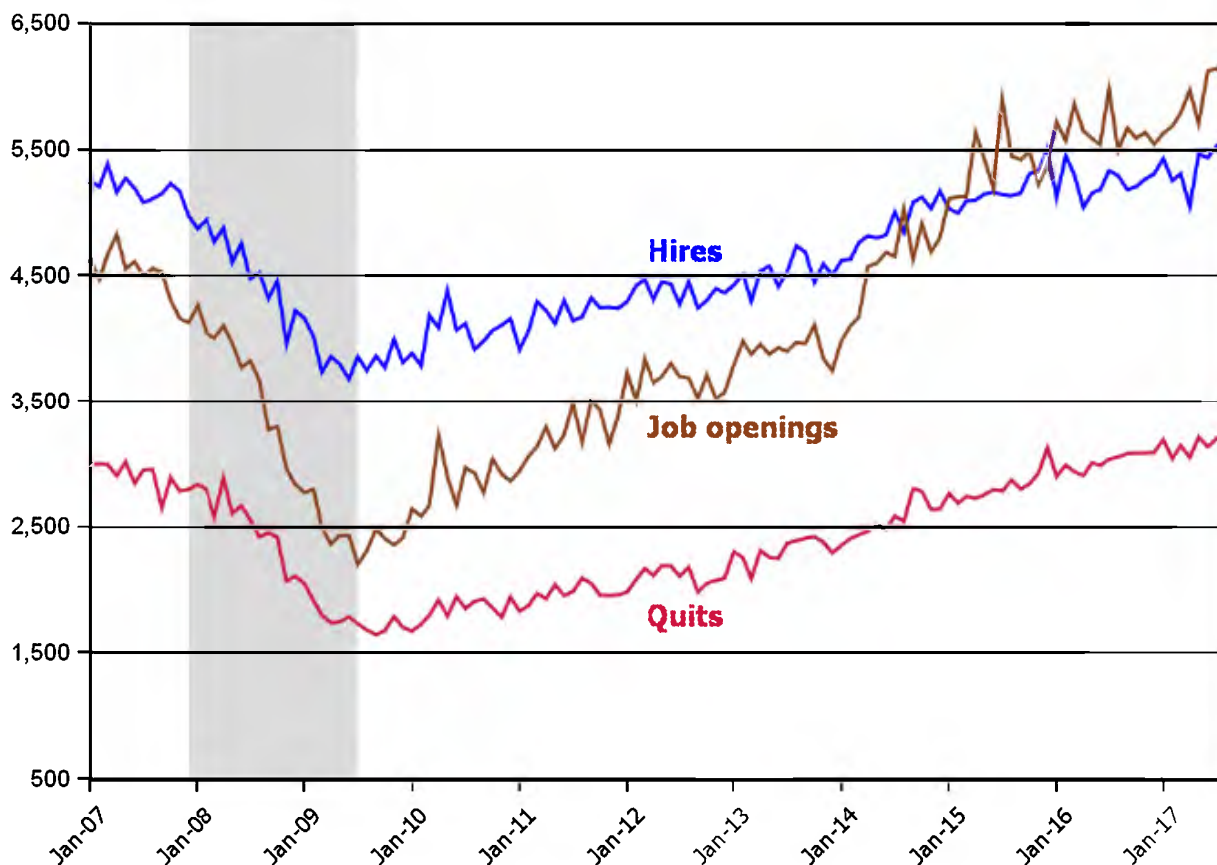
**Chart 4. The Beveridge Curve (job openings rate vs. unemployment rate)
Seasonally adjusted**



Source: Bureau of Labor Statistics, Current Population Survey and Job Openings and Labor Turnover Survey, October 11, 2017.

- The graph plots the job openings rate against the unemployment rate. This graphical representation is known as the Beveridge Curve, named after the British economist William Henry Beveridge (1879-1963). The economy's position on the downward sloping Beveridge Curve reflects the state of the business cycle.
- During an expansion, the unemployment rate is low and the job openings rate is high. Conversely, during a contraction, the unemployment rate is high and the job openings rate is low. A greater mismatch between available jobs and the unemployed in terms of skills or location would cause the curve to shift outward (up and toward the right).
- From the start of the most recent recession in December 2007 through the end of 2009, the series trended lower and further to the right as the job openings rate declined and the unemployment rate rose.
- In August 2017, the unemployment rate was 4.4 percent and the job openings rate was 4.0 percent.

Chart 5. Job openings, hires, and quits
Seasonally adjusted, in thousands

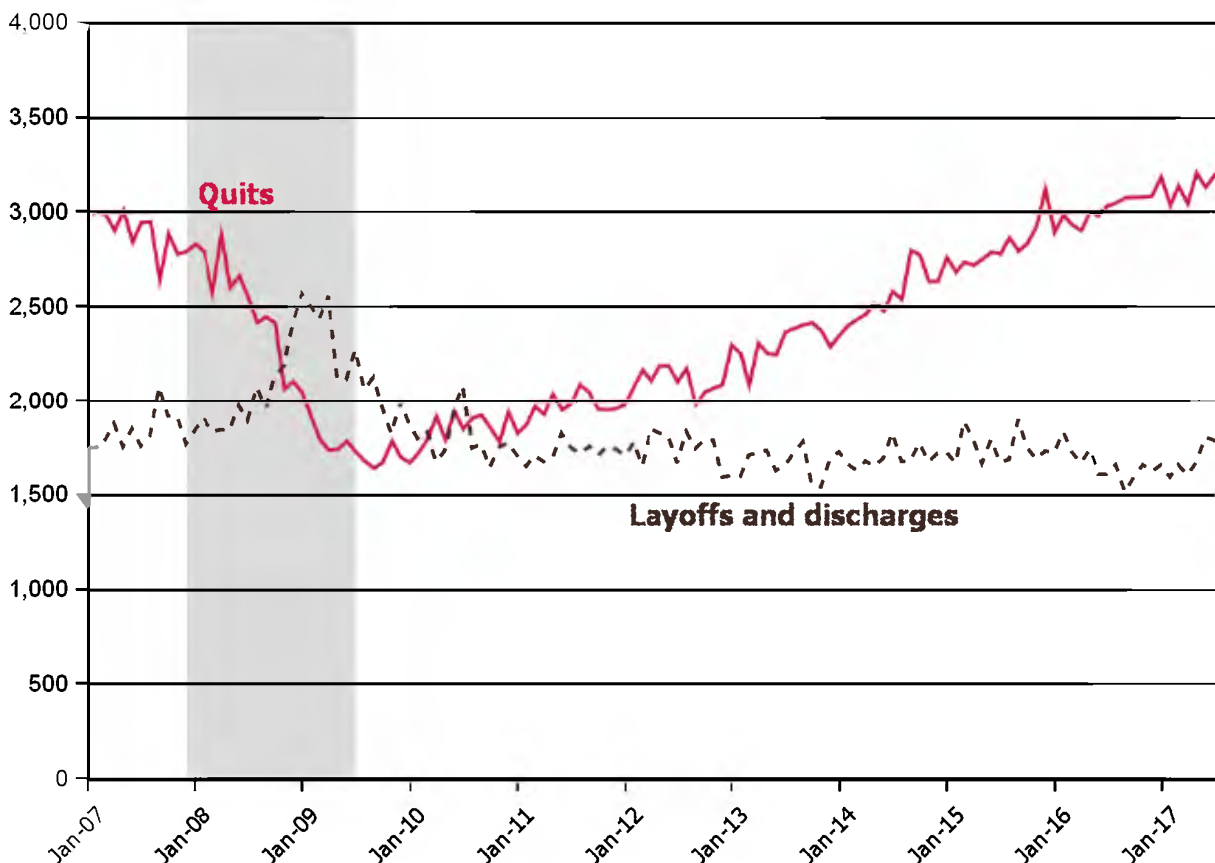


Source: Bureau of Labor Statistics, Job Openings and Labor Turnover Survey, October 11, 2017.

Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

- Job openings have increased since a low in July 2009. They returned to the prerecession level in March 2014 and surpassed the prerecession peak in August 2014. There were 6.1 million open jobs on the last business day of August 2017.
- Hires have increased since a low in June 2009 and have surpassed prerecession levels. In August 2017, there were 5.4 million hires.
- Quits have increased since a low in September 2009 and have surpassed prerecession levels. In August 2017, there were 3.1 million quits.
- For most of JOLTS history, the number of hires (measured throughout the month) has exceeded the number of job openings (measured only on the last business day of the month). Since January 2015, however, this relationship has reversed with job openings outnumbering hires in most months.
- At the end of the most recent recession in June 2009, there were 1.2 million more hires throughout the month than there were job openings on the last business day of the month. In August 2017, there were 652,000 fewer hires than job openings.

Chart 6. Quits and layoffs and discharges
Seasonally adjusted, in thousands



Source: Bureau of Labor Statistics, Job Openings and Labor Turnover Survey, October 11, 2017.

Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

- Quits are voluntary separations initiated by employees. Therefore, the quits rate can serve as a measure of workers' willingness or ability to leave jobs.
- The number of quits has exceeded the number of layoffs and discharges for most of the JOLTS history. During the latest recession, this relationship changed as layoffs and discharges outnumbered quits from November 2008 through March 2010.
- The difference between the number of quits and the number of layoffs and discharges has been increasing since April 2010. For the past year, however, this number has held steady at 1.3 to 1.6 million more quits than layoffs and discharges.
- In August 2017, there were 3.1 million quits and 1.7 million layoffs and discharges.

EXHIBIT 29

Results of Tom K. Wong, United We Dream, National Immigration Law Center, and Center for American Progress National Survey

Fielded 9/8/2016 to 9/26/2016

$n = 1,308$

APPLYING FOR DACA	..... 1
IMPACT OF DACA	..... 2-3
LABOR MARKET CONTRIBUTIONS	..... 4-5
DEMOGRAPHICS	..... 6-8
IMPACT ON CIVIC PARTICIPTION	..... 9

Methodology

The survey questionnaire was administered to an online panel of DACA recipients recruited by the partner organizations. Several steps were taken to adjust for the known sources of bias that result from such online panels. To prevent ballot stuffing—one person submitting multiple responses—the authors did not offer an incentive to respondents for taking the questionnaire and used a state-of-the-art online survey platform that does not allow one IP address to submit multiple responses. To prevent spoiled ballots—meaning people responding who are not unauthorized—the authors used a unique validation test for unauthorized status. Multiple questions were asked about each respondent’s migratory history. These questions were asked at different parts of the questionnaire, and some questions were repeated but posed using different wording. If there was agreement in the answers such that there was consistency with respect to the respondent’s migratory history, the respondent was kept in the resulting pool of respondents. If not, the respondent was excluded. In order to recruit respondents outside of the networks of the partner organizations, Facebook ads were also used to recruit respondents. Because there is no phone book of unauthorized immigrants and given the nature of online opt-in surveys, it is not possible to construct a valid margin of error.

Applying for DACA

Check all that apply. DID YOU RECEIVE ANY ASSISTANCE WHEN YOU APPLIED FOR DACA?

No, I filed on my own	.....	30.9%
I attended an information session put on by an organization, but I filed on my own	.....	35.2
I applied with the assistance of an organization	.....	23.8
I applied with the assistance of an attorney/immigration lawyer	.....	42.9

Note: sums do not add to 100 because respondents can select more than one option.

Impact of DACA

Check all that apply. After my DACA application was approved, I...

EMPLOYMENT

Got my first job	.....	42.5%
Got a job with better pay	.....	62.5
Got a job that better fits my education and training	.....	48.9
Got a job that better fits my long-term career goals	.....	47.7
Got a job with improved work conditions	.....	47.5

Check all that apply. After my DACA application was approved, I...

EARNINGS

Have been able to earn more money, which has helped me become financially independent	.....	60.2%
Have been able to earn more money, which has helped my family financially	.....	61.2

Check all that apply. After my DACA application was approved, I...

ECONOMIC IMPACT

Started my own business	.....	5.5%
Bought my first car	.....	54.1
Purchased car insurance		92.9
Purchased new car		28.8
Purchased used car		71.1
Average cost of new car		\$24,303
Average cost of used car		\$10,637
Bought a home	.....	12.1
Average cost of home		\$167,596
Paid off some/all of my student loans	.....	14.4

Check all that apply. After my DACA application was approved, I...

SOCIAL INCLUSION

Got my driver's license OR a state identification card for the first time	.....	90.1%
Average cost of driver's license		\$35
Average cost of identification card		\$28
Opened a bank account	.....	47.3
Got my first credit card	.....	57.1
Obtained health insurance	.....	65.9%
Did not obtain health insurance	.....	32.2
No response	.....	1.9

Check all that apply. After my DACA application was approved, I...

EDUCATION

Pursued educational opportunities that I previously could not	.....	60.7%
Haven't pursued more education yet, but I plan to	.....	36.9
Don't plan to pursue more education	.....	3.8

Labor Market Contributions of DACA Recipients

Are you *CURRENTLY EMPLOYED*?

Yes	.....	86.9%
No	.....	13.1
No response	.....	0.0

Are you *BILINGUAL*?

Yes	.....	97.0%
No	.....	2.8
No response	.....	0.2

Do you agree or disagree with the following statement? "MY BEING BILINGUAL HAS BEEN AN ASSET TO MY EMPLOYER."

Strongly agree	.....	74.5%
Agree	.....	14.1
Neither agree nor disagree	.....	8.3
Disagree	.....	1.5
Strongly disagree	.....	0.4
Not applicable	.....	0.9
No response	.....	0.4

Note: n = 1,108 bilingual respondents who are currently employed

In what *INDUSTRY* are you employed?

Agriculture, forestry, fishing, hunting	.....	0.7%
Mining	.....	0.0
Construction	.....	3.3
Manufacturing	.....	4.7
Wholesale and retail trade	.....	8.6
Transportation and utilities	.....	2.0
Information	.....	1.6
Financial activities	.....	4.1
Professional and business services	.....	7.6
Educational and health services	.....	21.3
Leisure and hospitality	.....	5.2
Other services	.....	6.9
Public sector	.....	2.5

Non-profit sector	.....	10.9
Other	.....	20.4

Note: n = 1,137 respondents who are currently employed.

Were you EMPLOYED BEFORE DACA?

Yes	.....	51.3%
No	.....	48.1
No response	.....	0.6
<hr/>		
Average hourly wage before DACA	.....	\$9.83
Average hourly wage now	.....	\$13.96
<hr/>		
% increase in wages	.....	42.0%

Demographics

What STATE do you currently live in? (TOP 5)

California	.....	25.8%
Texas	.....	11.8
New York	.....	6.4
Illinois	.....	6.4
Florida	.....	5.5
West	.....	39.8%
Midwest	.....	13.9
South	.....	33.6
Northeast	.....	12.7

What is your AGE?

15	.....	0.1%
16	.....	0.5
17	.....	1.5
18	.....	4.5
19	.....	4.9
20	.....	5.4
21	.....	6.9
22	.....	6.7
23	.....	7.9
24	.....	7.2
25	.....	8.3
26	.....	8.1
27	.....	6.9
28	.....	7.9
29	.....	5.7
30	.....	5.7
31	.....	3.8
32	.....	3.2
33	.....	2.5
34	.....	2.1
35	.....	0.2
Average and Median Age	.....	25

What is your RACE/ETHNICITY

White	.....	1.3%
Black	.....	2.1
Hispanic/Latino	.....	90.1
Asian or Pacific Islander	.....	4.7
Other	.....	4.7
No response	.....	0.2

How do you describe yourself? GENDER IDENTITY

Male	.....	32.7%
Female	.....	66.4
Do not identity as male, female, or transgender	.....	0.6
No response	.....	0.3

Do you think of yourself as... (please select all that apply) LGBTQ IDENTITY

Straight	.....	89.5%
Gay or lesbian	.....	5.4
Bisexual	.....	4.9
Transgender, transsexual, or gender non-conforming	.....	0.9
No response	.....	0.3

Note: sums do not add to 100 because respondents can select more than one option.

What is the HIGHEST DEGREE OR LEVEL OF SCHOOL YOU HAVE COMPLETED? If you are currently enrolled in school, what is the highest degree you have received thus far?

General Education Development (GED)	.....	2.4%
High-school diploma	.....	23.3
Some college	.....	25.8
Associate's degree	.....	16.4
Trade/technical/vocational training	.....	3.3
Bachelor's degree	.....	21.5
Master's degree	.....	4.2
Professional degree above a master's degree	.....	0.3
Doctorate degree	.....	0.2

No response	2.9
-------------	-------	-----

Are you CURRENTLY IN SCHOOL?

Yes	.....	46.4%
No	.....	53.4
No response	.....	0.2

What DEGREE are you currently pursuing?

General Education Development (GED)	.....	0.3%
High-school diploma	.....	3.3
Associate's degree	.....	20.4
Trade/technical/vocational training	.....	4.1
Bachelor's degree	.....	55.4
Master's degree	.....	11.2
Professional degree above a master's degree	.....	0.7
Doctorate degree	.....	2.5
No response	.....	2.1

Note: n = 607 respondents who are currently in school.

Impact on Civic Participation

Do you have an IMMEDIATE FAMILY MEMBER, MEANING A PARENT, SIBLING, SPOUSE, OR CHILD, WHO IS A U.S. CITIZEN AND IS 18 YEARS OR OLDER?

Yes	.....	40.8%
No	.....	57.7
No response	.....	1.5

Are any of your IMMEDIATE FAMILY MEMBERS WHO ARE U.S. CITIZENS AND ARE 18 YEARS OR OLDER REGISTERED TO VOTE?

Yes	.....	79.9%
No	.....	19.5
No response	.....	0.6

Note: n = 534 respondents with immediate family members who are U.S. citizens and are 18 years or older.

EXHIBIT 30



In the Shadows of the Ivory Tower:

Undocumented Undergraduates and the Liminal State of Immigration Reform



The UndocuScholars Project
The Institute for Immigration, Globalization, & Education
University of California, Los Angeles

CONNECTING RESEARCH TO PRACTICE AND POLICY

This report is the result of a joint collaborative effort between the Institute for Immigration, Globalization, and Education at the University of California, Los Angeles and the UndocuScholars Community Advisory Board, Research Advisory Board, and Student Advisory Board.

The authors of this report were: Robert T. Teranishi, Carola Suárez-Orozco, and Marcelo Suárez-Orozco. Other contributors included: Olivia Birchall, Cynthia M. Alcantar, Edwin Hernandez, Yuliana Garcia, Dalal Katsiaficas, Janet Cerda, Minas Michikyan, Monique Corral, Alicia Ayala, Saskias Casanova, Margary Martin, Nidia Gracia, and Cyndi Bendezu Palomino.

This research was made possible by the generous funding from the: *Ford Foundation*

UndocuScholars Research Team

Robert T. Teranishi, Co-Principal Investigator
Carola Suárez-Orozco, Co-Principal Investigator
Marcelo Suárez-Orozco, Co-Principal Investigator

Olivia Birchall, Principal Analyst
Cynthia M. Alcantar, Research Associate
Edwin Hernandez, Research Associate
Yuliana Garcia, Research Associate
Dalal Katsiaficas, Research Associate
Janet Cerda, Research Associate

Minas Michikyan, Research Associate
Monique Corral, Research Associate
Alicia Ayala, Research Associate
Saskias Casanova, Research Associate
Margary Martin, Research Associate
Nidia Gracia, Research Associate
Cyndi Bendezu Palomino, Research Associate

Community Advisory Board

Asian Students Promoting Immigrant Rights
through Education (ASPIRE-LA)
Coalition for Humane Immigrant
Rights of Los Angeles (CHIRLA)
Educators for Fair Consideration (E4FC)
Improving Dreams, Equality, Access,
and Success (IDEAS), UCLA
Immigrant Youth Justice League (IYJL)
New York State Youth Leadership
Council (NYSYLC)
Revolutionizing Asian American Immigrant
Stories on the East Coast (RAISE)
Student Immigrant Movement (SIM)
Students Working for Equal Rights (SWER)
United We Dream (UWD)

Advisory Board Members

Janet Awokaya
Fredrick D. Patterson Research Center, UNCF
Santiago Bernal
UCLA Center for
Community College Partnerships
Laura Bohorquez
United We Dream
Angela Chuan-Ren Chen
UCLA Undocumented Student Program
Gaby Garcia
CHIRLA
Katharine Gin
E4FC
Roberto G. Gonzales
Harvard University
Nancy Guarneros
Claremont Graduate University
Alfred Herrera
UCLA Center for
Community College Partnerships
Tina Kim
College Track
Susana Muñoz
University of Wisconsin-Milwaukee
Anthony Ng
ASPIRE-LA
William Perez
Claremont Graduate University
Pedro Trujillo
CHIRLA
Kent Wong
UCLA Labor Center
Hirokazu Yoshikawa
New York University

Student Advisory Board

Bethay Garcia
CHIRLA
Lupe Lopez
Northern Illinois University
Basti Lopez de La Luz
University of California, Irvine
Arlette Lozano
University of California, Los Angeles
Linett Luna Tovar
University of California, Los Angeles
Renata Martin
Brown University
Trisha Mazumder
University of California, Los Angeles
Martha Ortega
University of California, Santa Cruz
Pavitee Peumsang
University of California, Los Angeles
Luz Rodriguez
University of California, Riverside
Silvia Rodriguez
University of California, Los Angeles
Seth Ronquillo
University of California, Los Angeles
Eden Velasco
CHIRLA

Beyond our Advisory Board Members, we would like to thank those who generously took the time to review and provide valuable feedback to this report including Leisy Abrego (University of California, Los Angeles), Linda Lopez (Los Angeles Mayor's Office of Immigrant Affairs), Mark Hugo Lopez (Pew Research Center), Matt Matera (Scholarships A-Z), Kenny Nienhusser (University of Hartford), and Roberto Suro (University of Southern California).

EXECUTIVE SUMMARY

Amidst the turbulent crosscurrents of immigration reform, nearly a quarter of a million undocumented undergraduates are struggling to find their way in higher education. Their liminal state calls for research to inform the unique needs and challenges of this growing student population. In this report, we shed light on the range and complexities of undocumented undergraduates experiences based on a sample of 909 participants across 34 states originating in 55 countries. The participants attended an array of postsecondary institutions including two-year and four-year public and private colleges that range in selectivity. In this report, we describe their demographic characteristics, experiences in college, as well as their aspirations and anxieties. Further, we make specific recommendations for what colleges should consider to better serve this population. Lastly, in light of executive actions in 2012 and 2014, this data can be used to extrapolate some of the issues that are likely to define this newly protected immigrant population moving forward.

Characteristics of Undocumented Undergraduates

Undocumented students are diverse in terms of countries of origin, languages spoken at home, and religion. They encompass a range of immigration histories and vary along the spectrum of socioeconomic status.

- Participants emigrated from 55 different countries of origin
- On average, participants had resided 14.8 years in the U.S.; in most cases, the majority of their lives have been spent in the U.S.
- Participants reported 33 different primary languages spoken at home
- 61.3% had an annual household income below \$30,000, 29.0% had an annual household income of \$30,000 to \$50,000, and 9.7% had an annual household income above \$50,000
- 72.4% were working while attending college
- 64.1% reported having at least one member of their household who was citizen or lawful resident
- Deportation is a constant concern. Over ¾ of participants reported worries about being detained or deported. 55.9% reported personally knowing someone who had been deported including a parent (5.7%) or a sibling (3.2%)
- Undocumented undergraduates reported significantly elevated levels of anxiety. 28.5% of male and 36.7% of female participants' anxiety scores were above a clinical cut off level (in contrast to 4% and 9% of a norm population)

- Undocumented college students reported strong longings to belong in American society. A vast majority (90.4%) said they would become citizens if they could

Undocumented students also attend a wide range of post-secondary institutions – ranging in type, selectivity, and size – and represented a range of different academic majors.

- 28.2% were majoring in STEM, making these the most popular majors.
- 48.2% attended four-year public colleges or universities, 42.4% reported attending two-year public colleges, and 9.4% attended private colleges
- 67.6% were first-generation college students (neither parent had attended college)

The Policy Context for the Undocumented College Student Experience

We identified specific ways Deferred Action for Childhood Arrivals (DACA) was beneficial to some undocumented students relative to their financial stability and well-being, access to resources and opportunities, and participating more fully in college and society.

- 65.9% applied for and received DACA; DACA recipients were most likely to be female and attending four-year public and private colleges or universities

- 85.5% of students with DACA reported it had a positive impact on their education
- DACA recipients reported higher rates of working, receiving grants and scholarships, and participating in internships than students without DACA
- DACA recipients reported better access to transportation, more stable housing conditions, and a greater desire to become U.S. citizens if given the opportunity than students without DACA

However, there are also notable limitations to DACA that continue to impede access and success in higher education for undocumented students.

- Policies that determine whether or not undocumented students will pay in-state or out-of-state tuition, if they can gain access to certain forms of financial aid, and in some cases if they can enroll in institutions in certain states that are governed at the state, higher education system, and institution levels
- While DACA has been an important first step toward greater security, the provisional nature had many students asking, “What will happen when DACA ends?”
- A higher proportion of DACA recipients (89.6%) than DACA non-recipients (70.8%) reported ongoing worries about the detentions of friends and family, which are correlated with higher levels of anxiety among DACA recipients

The Campus Experience

Undocumented students face a number of unique barriers that impact their ability to attend and succeed in college, which have implications for the work of higher education practitioners.

- 56.7% reported being extremely concerned about financing their college education
- 75.6% of respondents attending two-year colleges and 69.4% of respondents attending four-year colleges worked while attending college, which inhibited their ability to succeed academically

- Among respondents who reported stopping-out, 73.9% indicated that it was due to financial difficulties

Undocumented students reported challenges within their campus communities and discussed a desire for safe spaces.

- Respondents spoke of their sense of isolation on campus as they felt uncertain about who they could trust
- Students reported high levels of being treated unfairly or negatively due to their legal status by faculty, counselors, other students, financial aid officers, campus administrators, and security guards/campus police
- Of the respondents with access to organizations, centers, or safe spaces where undocumented students can gather to share experiences, 73.1% reported making use of them; this highlights the importance of these spaces

Lessons Learned and Looking Ahead

Implications for Policymakers

- Considering that recent executive action will create employment authorization for more than 3.9 million tax-paying undocumented residents who will generate an estimated \$4 billion in new tax revenue, states should offer equitable tuition policies for undocumented students. The review of these policies is especially important for the states with unstipulated tuition policies and the nine states with restrictive tuition policies.
- The federal government should provide clear guidelines for ways the higher education community could better serve DACA students regarding work authorization, internships, and access to scholarships.
- There is a need for closer examination of the guidelines for federal and state financial aid for both, undocumented students and citizen and lawful permanent resident children of undocumented parents. For the latter group, procedures need to reflect changes to work

authorization for undocumented adults with citizen and lawful permanent resident children.

Implications for Colleges and Universities

- Higher education institutions should proclaim their commitment to and support for undocumented students as members of their campus communities. This endorsement should reflect their commitment to welcome, embrace, recognize, acknowledge, and provide a safe space for these students.
- There is a need within the higher education community for an on-going dialogue to inform admissions and outreach, financial aid, transition programs, student support services, retention programs, and efforts to assist students with pursuing graduate school or careers.
- It is particularly important for higher education institutions and systems to review and, if necessary, revise procedures related to DACA, including employment, internships, and study abroad.
- Faculty should anticipate having undocumented students in their academic programs, in their classrooms, and as advisees, be aware of their unique barriers and challenges, and be knowledgeable about resources on campus that can respond to their needs.
- Colleges and universities should be sites for legal clinics and other consultation services for undocumented residents in their local communities regarding DACA and other immigration matters. This affords current and aspiring law students with valuable, first-hand experience, and the opportunity to serve their local communities.
- Colleges and universities should provide counseling support and mental health services on campus provided by culturally responsive service providers.

Implications for Higher Education Associations, Scholarship Providers, Foundations, and Corporations

- Higher education associations and community advocacy groups should be the front-line providers for their constituents about how to navigate the process of gaining access to and succeeding in college.
- There is a need for philanthropy to engage with scholarship providers and the higher education community to develop funding opportunities for undocumented students at the undergraduate and graduate levels.
- Foundations should support research that can generate information about innovative and effective programs and practices.
- Corporations should review their recruitment and hiring practices to afford undocumented students with access to internships and other career opportunities.

Contents

EXECUTIVE SUMMARY	i
INTRODUCTION	1
Background and Context	1
Purpose of the Report	2
THE UNDOCUSCHOLARS PROJECT	4
CHARACTERISTICS OF UNDOCUMENTED UNDERGRADUATES	5
Student Demography	5
Representation in Institutional Settings, Majors, and GPAs	8
THE POLICY CONTEXT FOR UNDOCUMENTED COLLEGE STUDENTS	9
The Benefits of DACA	9
The Limitations of DACA	12
THE CAMPUS EXPERIENCE	17
Contending with Unique and Multiple Barriers	17
Campus Climate and the Need for Safe Spaces	18
CREATING AN ‘UNDOCUFRIENDLY’ CAMPUS	20
LESSONS LEARNED AND LOOKING AHEAD	21
Implications for Policymakers	21
Implications for Colleges and Universities	21
Implications for Higher Education Associations, Scholarship Providers, Foundations, and Corporations	22
GLOSSARY OF TERMS	23
TECHNICAL APPENDIX	25
General Description of Recruitment	25
Analysis Procedure	26
ENDNOTES	29

INTRODUCTION

Amidst an era of deep anxieties about the economy, national security, and rapidly changing demographics, immigration sits center stage as one of the most polarizing social and political issues in American society. Undocumented youth who arrive to the US as children have become a central focus of the immigration debate. While the 1982 *Phyllis v. Doe* U.S. Supreme Court decision affords undocumented youth access to a K-12 education, there is no similar federal edict that informs how undocumented youth are to be treated in postsecondary educational settings. Faced by a broken immigration system¹ along with multiple challenges associated with this socially stigmatized status², the educational aspirations of too many undocumented youth go unrealized.

Over the last decade and a half, a social movement among undocumented youth emerged calling for greater access to higher education and a pathway to citizenship. In response, a bi-partisan legislative proposal – the Development, Relief, and Education for Alien Minors (DREAM) Act – has been introduced in several forms in the House of Representatives and the Senate, but has failed to become law. Acknowledging the lack of legislative action and the tenuous state of undocumented youth, President Obama took executive action in 2012 to create the Deferred Action for Childhood Arrivals (DACA) program,³ which protects many undocumented youth from deportation and provides a temporary permit to work. In 2014, President Obama extended the DACA age eligibility, in addition to offering deferred action for undocumented parents of citizen children – Deferred Action for Parental Accountability (DAPA).⁴

Despite this recent executive action, a great majority of policies determining the treatment of undocumented students in college settings are made at the state, higher education system, and institution levels. These policies determine whether or not undocumented students will pay in-state or out-of-state tuition, if they can gain access to certain forms of financial aid, and in some cases if they can enroll in institutions in certain states. In other words, individual states and institutions have institutionalized a wide variety of higher education policies that range from relatively inclusionary to highly exclusionary.⁵ Given this policy context, there is a need for a broader understanding and discourse about undocumented undergraduates. In this report, we shed light on the range and complexities of undocumented college student experiences and provide recommendations for policy and practice.

Background and Context

Over the past 35 years, the undocumented population has increased dramatically from under a million in 1980, peaking at nearly 12.2 million in 2006, to a current estimate of approximately 11.3 million.⁶ An estimated 2.1 million youth arrived to the United States as children, during the peak years of the great migration at the turn of the millennium.⁷ Unsurprisingly, given the many obstacles undocumented children and youth face, few have found their way to college.⁸

Mixed-Status Households

In 2014, President Obama announced deferred action for undocumented parents of U.S. citizens and lawful permanent residents, Deferred Action for Parental Accountability (DAPA), along with expanding the DACA age eligibility. It is estimated that there are 16.6 million people who live in mixed-status families – that is a family with at least one undocumented immigrant and one U.S. citizen or lawful permanent resident.²⁹ The Pew Hispanic Center estimates that 4.5 million U.S.-born children have at least one undocumented parent.³⁰ In 2012, the Department of Homeland Security deported 88,517 undocumented immigrants who reported having at least one U.S. citizen child.³¹ The Applied Research Center found that in 2011, at least 5,100 U.S. citizen children of undocumented immigrants were living in foster care due to their parents being detained or deported.³²

The Pew Research Center estimates that about 200,000 to 225,000 undocumented immigrants are enrolled in college, accounting for about two percent of all college students.⁹ While approximately 25 to 30% of all 16 to 24 year olds enroll in college, only about 10% of undocumented immigrants ages 16 to 24 appear to do so.¹⁰ When they do, they are more likely to attend 2-year colleges,¹¹ a

setting that offers opportunities for advancement, but with lamentably low transfer and graduation rates.¹²

We position the current report in the context of past research that has shed light on the ways in which undocumented students face a number of challenges that are unique to their legal status. Key themes emerging from the literature include:

Undocumented youth experience unique developmental challenges that impact college access. They are disproportionately more likely to grow up in poverty, crowded housing, lacking health care, and residing in households where families have trouble paying rent and affording food.¹³ As undocumented adolescents and young adults begin to make critical developmental transitions, they confront a series of barriers that interrupt them from moving forward in tandem with their documented peers,¹⁴ such as driving and taking their first job; undocumented youth are legally excluded from these important rites of passage.¹⁵

Affordability is a significant factor that impacts college access and choice for undocumented students. Financing college has been noted to be a source of stress and a barrier to higher education for many undocumented college students.¹⁶ Because of lack of access to in-state tuition or financial aid for many undocumented students, many are attending colleges that are closer to home, choosing to attend college based on affordability, and are more likely to work.¹⁷

Resiliency and determination to achieve higher levels of academic achievement are common among undocumented college students.¹⁸ Like all immigrants, undocumented immigrant youth possess an array of strengths including hope, optimism, and motivation, which can serve them well in their educational pursuits.¹⁹ However, undocumented students take longer to complete a bachelor's degree than documented immigrant students due to the lack of affordable college tuition and access to financial aid.²⁰ Compared to documented immigrant students, a greater proportion of undocumented students have been found to enroll as part-time students, take time off from school, and delay matriculation after high school.²¹

Psychological well-being is a barrier to academic and social engagement. Undocumented college students report disproportionately high levels of stress, anxiety, and fear due to their undocumented status.²² Their college experience is also affected by feelings of shame and uncertainty and they report higher levels of perceived discrimination.²³ Studies have also found that undocumented college students report feelings of isolation on campus due to their fear of disclosure, and barriers associated with a lack of community and limited support from institutional agents.²⁴ Undocumented students have reported high levels of fear of their own deportation or the deportation of family members.²⁵

While these studies have shed considerable light on the undocumented student experience, they have primarily relied on samples of students in only a handful of states, focused almost exclusively on Latinos, and examined the college student experience in more selective, four-year colleges and universities. Thus, there are gaps in knowledge related to the experiences and outcomes of undocumented students from different racial and ethnic backgrounds, attending college in different states or in a range of institutional settings.

Purpose of the Report

The impetus for this study was the lack of survey data to empirically represent the range of educational experiences and life circumstances of undocumented undergraduates. Thus, in this research project, we aimed to study students from a range of racial and ethnic backgrounds, in as many states as possible, and in a range of different institutional settings. We discuss the results from the survey in the context of the liminal state of immigration reform and its impact on college access and success for undocumented undergraduates. The following questions informed the findings provided in this report:

1. What is the profile of undocumented undergraduates including demographics (e.g., gender, countries of origin, language, religion, socioeconomic background) and student characteristics (e.g., colleges attended, majors)?

2. In what ways are undocumented undergraduates who applied for DACA different from those who did not? What are the benefits of DACA described by the undocumented undergraduates who applied for and received it? And what are the limitations?
3. What are the lessons learned from undocumented undergraduates that can inform higher education policies and practices?

This report seeks to provide a comprehensive perspective of the experiences and outcomes of undocumented undergraduates in higher education, including the demography of this student population, an understanding of where and why they enroll in college, and how they present unique challenges for individual campuses, states, and our national higher education priorities generally. We also place the study of the undocumented student experience in the context of higher education priorities. At a time when our national higher education reform efforts have prioritized increasing the proportion of our population with a college degree, undocumented students have been neglected and their potential has been under-realized. To this point, it is important to consider the undocumented student population in the context of the democratic mission of US higher education, which emphasizes the value of an educated citizenry for the good of society.

THE UNDOCUSCHOLARS PROJECT

Responding to the need for research on undocumented college undergraduates, we launched the UndocuScholars Project, which is housed in the Institute for Immigration, Globalization, and Education (IGE) at the University of California, Los Angeles.

The primary focus of the UndocuScholars Project is to expand the capacity in the field to pursue the following objectives:

- **Expand the knowledge base** on undocumented students to challenge false assumptions, damaging misperceptions, and the extent to which immigrant sub-groups are misunderstood and mischaracterized in higher education and in the broader mainstream public;
- Focus more attention on how our **research informs institutional practices**, which is critical for expanding postsecondary opportunities and outcomes of undocumented students in higher education. Specifically, we want to identify and highlight models of successful practices in institutions that vary by institutional type (2-year and four-year) and control (public and private); and
- Develop and pursue a strategy to **guide the discourse about immigrants** in the mainstream public broadly, and for the policymaking discourse and process specifically, with a particular emphasis on increasing knowledge about the heterogeneity among undocumented students.

A significant strand of work in the UndocuScholars Project was a national survey focused on the experiences of *undergraduate* undocumented students. The measures used in this study were closely informed by existing research conducted by the *Research on Immigrants in College Project*, the *Higher Education Research Institute*, the *National UnDACAmented Research Project*, and Professors Sara Goldrick-Rab at the University of Wisconsin and William Perez at Claremont Graduate University. We consulted closely with the UndocuScholars Student Advisory Board (consisting of student leaders and advocates), Community Advisory Board (consisting of national organizations working closely on behalf of undocumented youth), and Research Advisory Board (well-regarded organization leaders, practitioners,

and faculty advisors with complementary expertise) in the development, piloting and adaption of the measures in order to appropriately tailor them for undocumented undergraduates and make them relevant for the undocumented community. The majority of the items were forced choice items, though three open-ended qualitative questions were included. One pertained to the experience of anxiety; another to how life had changed (if at all) since DACA; and the third asked for recommendations to improve the campus experience of undocumented college students (see undocuscholars.org to view the protocol).

We developed a web portal and ongoing social media campaign as our primary strategy for participant recruitment. The website served to generate initial interest about the UndocuScholars Project as well as to recruit participants nationwide (see undocuscholars.org). The Community Advisory Board was also essential to the recruitment of students from particular states and institutions. The UndocuScholars website linked to the survey on Qualtrics which in turn provided a checklist of inclusion criteria including: being born outside the U.S. and self-identifying as undocumented; being enrolled in college as an undergraduate;²⁶ being between the ages of 18-30 years. The initial part of the questionnaire took participants through the inclusion questions and those who did not meet criteria were not able to complete the survey. Participants took a median time of 34 minutes to complete the survey. Participants were provided a \$20 gift card for completing the survey. Participants were assured anonymity; as soon as it was determined that the survey response was legitimate, the participants were sent the link to the gift card, and the email was deleted from our server to protect their anonymity.

Our sample included 909 participants from 34 states; 53.9% were female; and their ages ranged from 18 to 30 years, with an average age of 21.4 years. The full demographic characteristics of the respondents are described in the next section. See the Technical Appendix for a comparison of our sample to benchmark samples.

CHARACTERISTICS OF UNDOCUMENTED UNDERGRADUATES

Our survey results shed light on the demographic profile of undocumented students, revealing the extent to which they are a remarkably diverse population. They are diverse in terms of country of origin, language spoken at home, and ethnicity. They encompass a range of immigration histories and occupy varied positions along the spectrum of socioeconomic status. Students also attend a wide range of postsecondary institutions, which vary by type, selectivity, and size. These demographic characteristics of the undocumented college student respondents are described below.

Student Demography

Data reveal that while the majority of undocumented students are Latino, they represent nearly every major racial group, including Black, White, and Asian American and Pacific Islander, as well as a number of different ethnic sub-groups.²⁷ Among Latinos, the largest representation originated from Mexico followed by countries in Central America. The second most ethnically-diverse group was Asian American and Pacific Islander respondents representing 14 different East Asian, South Asian, Southeast Asian, and the Pacific Island countries of origin. Respondents also hailed from Europe, the Middle East, Africa, and the Caribbean. Overall, the respondents to our survey emigrated from 55 different countries of origin (Table 1).



Table 1. Countries of Origin of Undocumented College Student Respondents

Latin America & The Caribbean	Asian and Pacific Islands	Africa	Europe	Middle East
Mexico Peru Colombia Guatemala El Salvador Argentina Brazil Venezuela Honduras Chile Costa Rica Cuba Ecuador Belize Bolivia Nicaragua Panama Paraguay Uruguay	South Korea Philippines India China Indonesia Thailand Mongolia Bangladesh Malaysia Nepal Pakistan Samoa Taiwan Vietnam	Kenya Algeria Mauritius Republic of Congo South Africa	Lithuania Spain Poland Bulgaria Czech Republic Italy Romania Ukraine	Iraq Jordan Saudi Arabia

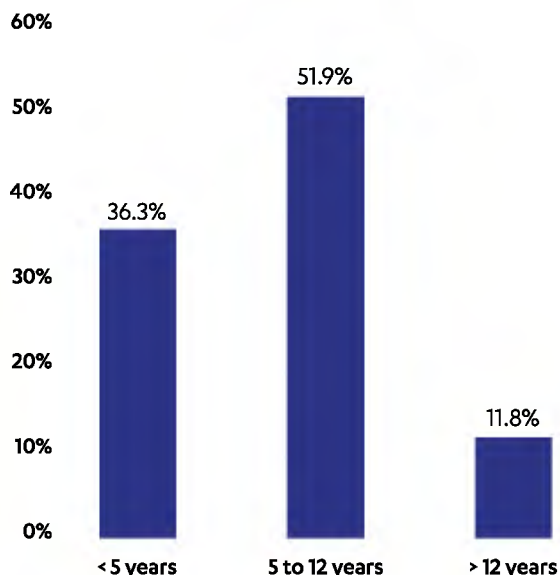
Note: The countries of origin are listed in order of frequency. For a full distribution of respondents' countries of origin, see the Technical Appendix.

Countries of Origin of Undocumented College Student Respondents



Undocumented college students represent a range of immigration histories. While the average age upon arrival for respondents in our sample was 6.6 years there was a wide distribution in age of arrivals (Figure 2). Some 36.3% arrived before they were 5 years old, 51.9% arrived between the ages of 5 and 12 years old, and 11.8% arrived between the ages of 12 and 16 years old.²⁸ On average, our participants had resided 14.8 years in the U.S.; in most cases, the majority of their lives.

Figure 1. Distribution of Age Upon Arrival in the U.S.



They bring with them a rich linguistic reservoir – reporting 33 different primary languages spoken at home. Approximately half of the participants had been enrolled in English Language Learner (ELL) or bilingual education in elementary school in the process of learning English. Another 22.6% were enrolled in English-language programs during middle school; 27.5% had never been enrolled in ELL or bilingual education.

The diversity of the participants was further reflected in their reported religious affiliations: 49.6% of respondents identified as Catholic, 14.1% as Protestant or other Christian, 3.2% as either Jewish, Muslim, Buddhist or Hindu, and 2.9% as “Other.” There were an additional 30.2% of the respondents who reported having no religious affiliation. Among the religiously minded, 61.2% of Catholics and 80.5% of Protestants and other Christians reported that religion was “important” or “very important” in their lives.

The majority of the undocumented college students reported living in mixed-status households. A large percentage of participants (64.1%) reported that at least one member of their household had birthright citizenship or had been naturalized. The majority reported having at least one documented sibling (59.9%) while 87.0% reported that one or both of their parents were undocumented. The fear of deportation was ever present in their lives; more than half of the participants (55.9%) reported personally knowing someone who had been deported. The vast majority of undocumented college students (84.6%) reported worrying about



the deportation or detainment of family or friends, while 76.1% reported worrying about being detained or deported themselves. Fifty-two of our participants (5.7%) reported that their parents had been deported and 29 respondents (3.2%) reported that a sibling had been deported. Family separations, either as a result of stepwise migration or following deportation, are not uncommon for this population. Nearly one in ten (9.0%) respondents reported that their mother does not currently reside in the United States, and nearly one in five (19.5%) reported this concerning their father.

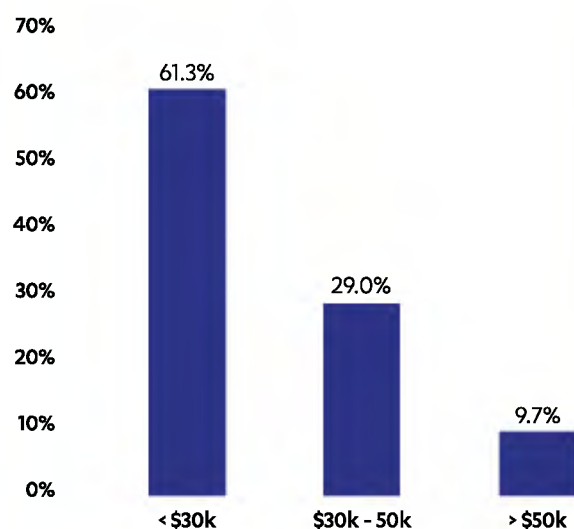
Undocumented students represent a range of socio-economic backgrounds. While 61.3% of the respondents had an annual household income below \$30,000, 29.0% had an annual household income of \$30,000 to \$50,000, and 9.7% had an annual household income above \$50,000 (Figure 2).

The level of parental education also varied considerably among respondents. A majority of the respondents (67.6%)

met the definition of being a first-generation college student (neither parent had ever attended college). There were 14.4% of respondents who reported at least one parent with a bachelor's degree or higher, and 5.4% have at least one parent with a master's degree or an advanced degree.

These data point to the rich diversity of the undocumented undergraduate student population that defy easy generalizations and ready-made stereotypes. The complex layers of demographic and socio-cultural characteristics provide a new prism to view one of the most marginalized, overlooked, and underserved populations in higher education. Even as they represent a rich tapestry, there are common threads binding them into the fabric of the nation: they have all attended American schools, they aspire to pursue careers requiring a higher education, they work long hours, and long for citizenship and to belong in their new land. In the following section, we provide some context for the educational and lived experiences of undocumented students.

Figure 2. Students' Self-Reported Household Income



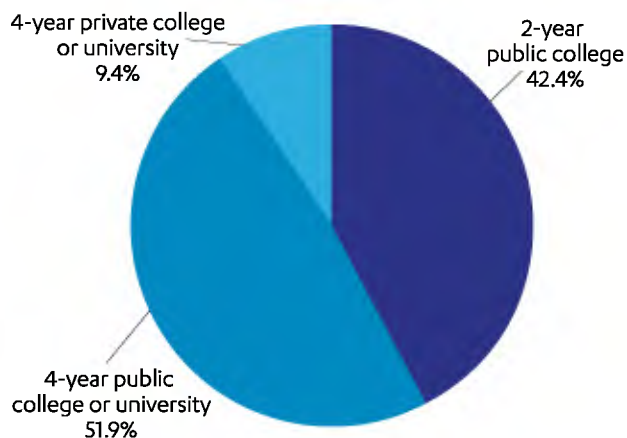
Asian Americans and Pacific Islanders

It is estimated that there are 1.4 million undocumented Asian American and Pacific Islander (AAPI) residents, representing 11.4% of the undocumented population in the U.S. The four most common countries of origin for AAPIs are India, China, the Philippines, and Korea, which constitute 88.6% of undocumented AAPI residents.³⁴ While the number of undocumented immigrants from Mexico and other Latin American countries has been declining numerically and in their proportional share of all undocumented residents over the past five years, there has been a steady increase among undocumented immigrants from India, China, and the Philippines over this same time period.³⁵

Representation in Institutional Settings, Majors, and GPAs

Similar to the heterogeneity between undocumented students at the individual level, their distribution in higher education is equally diverse. Respondents in our study, for example, attended a range of postsecondary institutions including 2-year and four-year public and private colleges that ranged in selectivity. A fraction attended private colleges (9.4%), while 48.2% reported attending 4-year public colleges or universities, and 42.4% reported attending 2-year colleges (Figure 3).

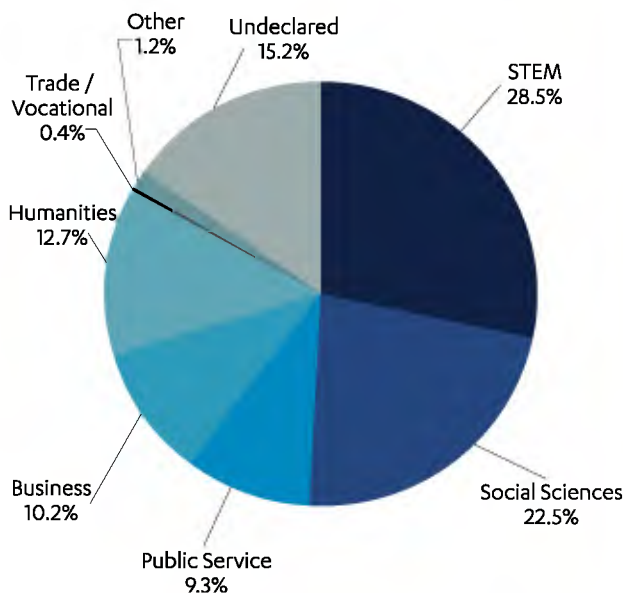
Figure 3. Distribution of Student Participants by Institutional Type



The students reported pursuing a wide array of majors from STEM (e.g., math, science, computer science, pre-medicine, etc.), social sciences, public service, business administration, humanities, and vocational fields. Almost one-third (28.2%) reported pursuing studies in STEM fields and another

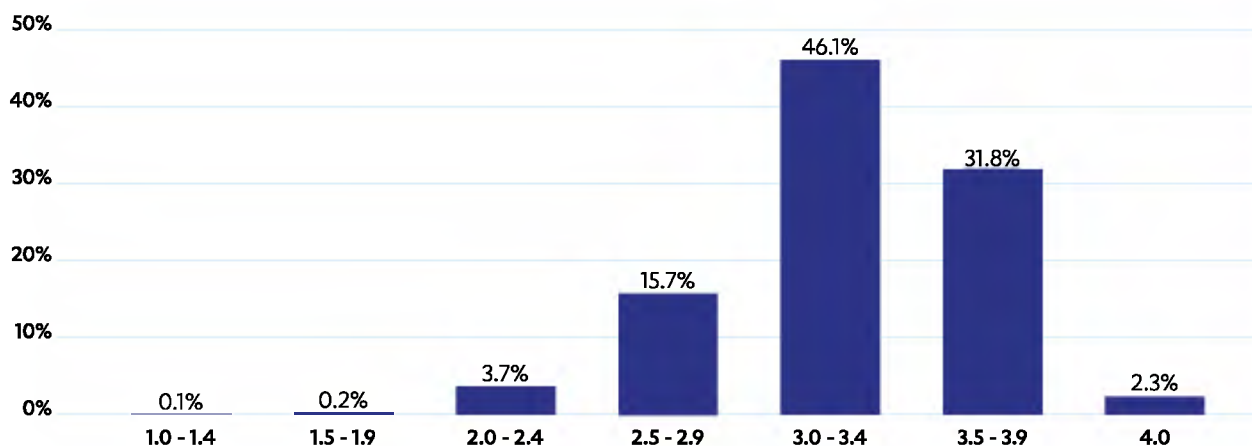
9.5% were studying in public service fields (e.g., education, nursing, kinesiology, social work, and pre-law) (Figure 4).

Figure 4. Distribution of Student Participants by Major



The participants were by and large high achievers with fairly high grades (Figure 5). Of those in 2-year public colleges, 79.4% reported a GPA of over 3.0, 86.0% in 4-year public colleges reported this high GPA attainment, and 84.6% of the 4-year private college students did so. These percentages surpass the national rates of undergraduate students with 3.0 GPAs and above (50.6% of 2-year college students, 51.5% of public four-year college students, and 66.5% of private 4-year college students). The participants had high education aspirational goals with 29.7% expecting to attain a master's degree and another 13.6% expecting to attain an advanced degree beyond the master's level.⁶⁰

Figure 5. Self-Reported Cumulative Grade Point Average During College



THE POLICY CONTEXT FOR UNDOCUMENTED COLLEGE STUDENTS

Deferred Action for Childhood Arrivals (DACA) offers temporary protection to some undocumented youth from deportation as well as a temporary permit to work. In many states DACA status allows recipients to apply for driver's licenses for the first time.³⁶ The *National UnDACAmented Research Project* found that over the last two years since DACA was instituted, DACA has increased young undocumented adults' employment rates, provided opportunities to open bank accounts and establish credit, and expanded job opportunities for college graduates.³⁷ We were interested in ascertaining some of the specific perceived benefits of obtaining DACA status for the college-going population.

Within our sample, 65.9% applied for and received DACA, while 16.0% indicated they did not qualify (for various reasons, such as they had not continuously resided in the U.S. for 5 years). A remaining 11.6% thought they might qualify but had not applied and 1.6% were in the application process or had been refused. There was missing data for the remaining 5.3%. This participation rate in DACA is higher than the 48% of the eligible undocumented immigrant youth who had applied for and received DACA two years after it was initiated, which makes sense considering our focus was on the college student population.³⁸ In our sample, females and students attending four-year institutions were more likely to apply for and receive DACA.³⁹ We considered the ways in which DACA recipients' experiences and responses were distinct from those of non-DACA recipients. We also asked the DACA recipients to shed light on whether and how DACA had changed their day-to-day experiences.

The Benefits of DACA

Over three quarters (85.5%) of students with DACA reported a positive impact on their education. We delved deeper into what students reported were the main benefits in their lives once they received DACA. The main benefits revolve around financial well-being, gaining access to valuable internships, greater stability with housing and transportation, and greater likelihood of participating more fully in college and society.

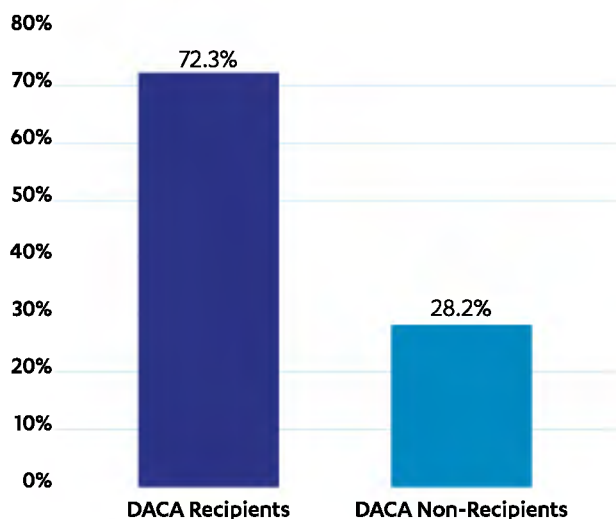
DACA recipients benefited from greater financial well-being

A key benefit of DACA is that it affords undocumented youth with a work permit, an advantage frequently noted by our respondents. We found that students with DACA were much more likely to have paid work experience (72.3%), compared to students without DACA (28.2%) (Figure 6).

In some cases, students who had previously worked in low-skilled jobs, similar to the kind in which their parents toiled, were now able to work in jobs more commensurate with their skills. These kinds of jobs had been arduous and allowed little flexibility to allow them to concentrate on

their studies. As many students indicated, this new authorization to work provided an opportunity for work aligned with their topic of study, *"Obtaining DACA status impacted my college experience directly in enabling me to get a job relevant to my career choice"* [Male from Maryland attending a 4-year public college].

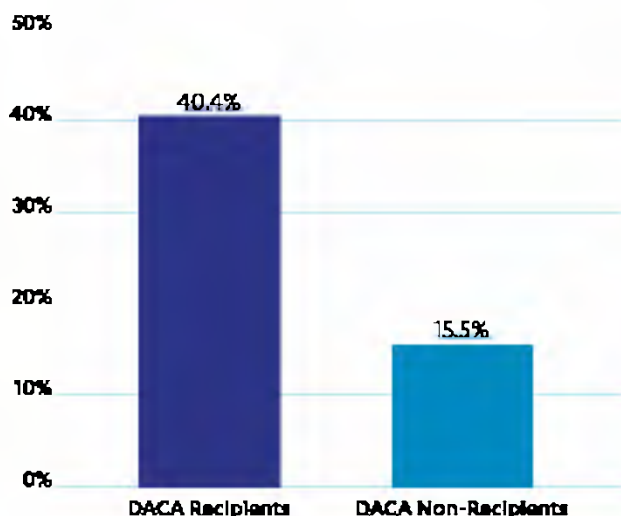
Figure 6. Students with Paid Work Experience



DACA recipients were afforded more opportunities to gain valuable internship experiences

The fact that many internship providers have residency restrictions has hindered undocumented students from gaining access to valuable opportunities. Our data reveal that students with DACA were more than twice as likely to have had an internship experience, compared to students without DACA (Figure 7). Most of these students were also attending a four-year college.

Figure 7. Students with Internship Experiences



Moreover, more than half of the students with internships (51.1%) also reported receiving compensation for their work. Thus, the opportunity to pursue internships – what many middle-class young adults take for granted as part of their professional development – was another notable benefit that came with DACA. As one participant explained: “Most notably in the pursuit of internships, on-campus jobs, and other paid opportunities key and essential to my professional development” [Male from Massachusetts attending a 4-year private college].

For some students, access to internships is a prerequisite to a career in their field of training. Over three quarters of students (77.4%) who have had internships reported that their internship experiences had provided skills that prepared them for career track positions in their field of choice after college. The importance of internships was also a salient theme for students in STEM fields, which represented 28.2% of our respondents. One student explained:



“DACA changed my life completely. Before DACA, I could not obtain any internship because I was always asked for a work permit and a social security number. As soon as I received DACA, I was accepted as an engineering intern at a biotech company where I developed my professional and academic skills. This made the training and education I was receiving in my classes much more relevant... And I didn’t have to worry about finding a job after school since the company I interned for offered me a full-time position as a mechanical engineer” [Male from California attending a 4-year public college].

DACA recipients had more stability with transportation and housing

An important aspect of the college experience is the stability in housing and transportation that enables students to be more fully engaged academically and socially on campus. However, three quarters of our respondents (75.5%) reported living off-campus, commuting seven hours a week to campus on average, which is greater than the national average. For some students, the journey to and from college and work was often relegated to public transportation, resulting in long commutes and more wasted time. As a student explained, “I commute and work. I take the bus to school so it takes up a lot my time that I can be using to study, do homework, etc.” [Female from California attending a 4-year public college]. Some students discussed how DACA afforded them with opportunities to obtain a driver’s license, which eased their commute to and from campus. As one student stated, “I acquired a driver’s license which makes my commute a lot easier

and safer" [Female from California attending a 4-year public college]. On average, students who had attained DACA status had average commute times that were two hours a week shorter than students who did not have DACA (7 hours per week vs. 9 hours per week respectively).

Students with DACA also noted that access to identification enabled them to attain better housing conditions. This turned out to be critical for freedom from harassment, stability, and predictability in juggling school, work and family obligations. One student described the difference in his housing situation before and after having DACA:

"With DACA I was able to get an apartment because I now obtained a social security. My first year here at [a public 4 year college] I lived in a 2 bedroom apartment with 5 other undocumented students who also attended [same institution] but at the time I was not on the lease because I did not have a social [security number]. Whenever the landlord stopped by I had to leave the apartment or hide from her. The landlord was worse than ICE. Not anymore" [Male from California attending a 4-year public college].

DACA recipients participated more fully in college and society

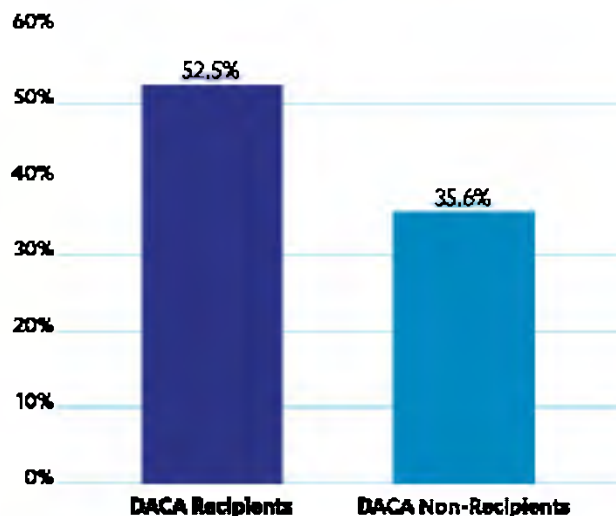
There were benefits associated with DACA that went beyond the tangibles -- IDs, work, driving (in most states), internships, less precarious housing and so on. Living in the shadows brings feelings of shame, stigma, and invisibility. A salient theme among students with DACA was a self-reported reduction in feelings of shame. Young people who have grown up in the U.S. were now able to navigate simple day-to-day interactions with a reduced sense of stigma. As one student stated, *"Now I can do research work on-campus and get paid and not be awkward/ashamed in regard to coming out with my immigration status"* [Male from California attending a 4-year public college]. Relatedly, students with DACA reported that their sense of pervasive social invisibility diminished. For example: *"Before DACA I felt unsafe and invisible"* [Female from New York attending a public 2-year college]. Since receiving DACA, one student reported, *"I feel a lot better about myself as I feel as if I were finally a visible part of our society"* [Male from Illinois attending a 4-year public college].



Some of the participants expressed an improvement in emotional well-being as their stress began to be alleviated after receiving DACA. One student explained: *"I do not feel as worried about my immigration status as I did before, therefore I am less prone of feeling anxious and depressed - something I experienced greatly before DACA"* [Female from California attending a 4-year public college].

Many students with DACA tied their newfound well-being to a belief that their future prospects had finally improved. They could now plan. As one student said, *"It (DACA) has allowed me to believe in my dreams, especially in finding my identity and reaching my ultimate goal"* [Female from Illinois attending a 4-year college]. With DACA, students began to feel that they could cautiously lean into aspirations that had long been hidden and or cast aside: *"It gave me the liberty to come out of the shadows and demonstrate my desire to accomplish my dreams"* [Female from California attending a public 2-year college]. This was also reflected in the quantitative findings that revealed higher educational aspirations among students with DACA (Figure 8).

Figure 8. Proportion of Students with Aspirations to Obtain an Advanced Degree



DACA Recipients' Longing to Belong

We asked our participants if, given the opportunity, they would apply for U.S. citizenship if they could. The vast majority indicated they would do so, with 76.1% saying they were “very likely” to do so, with another 14.3% responding “likely”; only 6.8% were “undecided,” 1.0% “unlikely,” and 1.8% “very unlikely.”

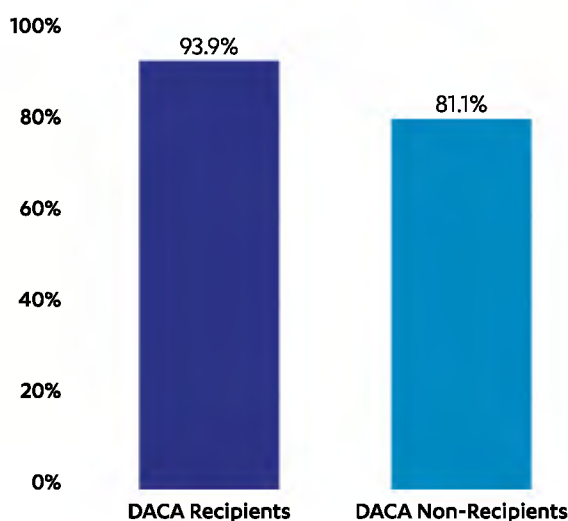
Noteworthy were the ways in which students with DACA referred to how their status contributed fundamentally to their sense of belonging to American society: *“It opened up my world to new opportunities, but more importantly it has restored my sense of belonging in this country and desire to better myself”* [Female from Washington attending a 4-year public college]. The symbolism of the new status meant: *“I feel I belong in America, because I have a legal status”* [Female from California attending a public 2-year college]. However, DACA status technically does not provide a permanent *legal* status; it simply provides lawful presence, a temporary reprieve from deportation, a point that some recipients did not seem to recognize. Simple phrases, repeating the same theme, reoccurred across surveys: *“It has restored a sense of belonging to this country”* [Male from California attending a 4-year public college]; *“I now feel like I am part of this society.”* [Male from Connecticut attending a 4-year private college]; *“I feel more American”* [Male from California attending a 4-year public college]. Indeed, these aspiring Americans longed to engage and contribute more fully to society.

We also found that students with DACA were more likely to indicate they would apply for U.S. citizenship if eligible, compared to students without DACA (93.9% vs. 81.1% respectively) (Figure 9).

“I was raised here—it is my home sweet home, so why is it wrong for me to want to stay, serve, help and work here? I too love the U.S.A., want to be a citizen, and have freedom.”

[Female from New York attending a 4-year public college]

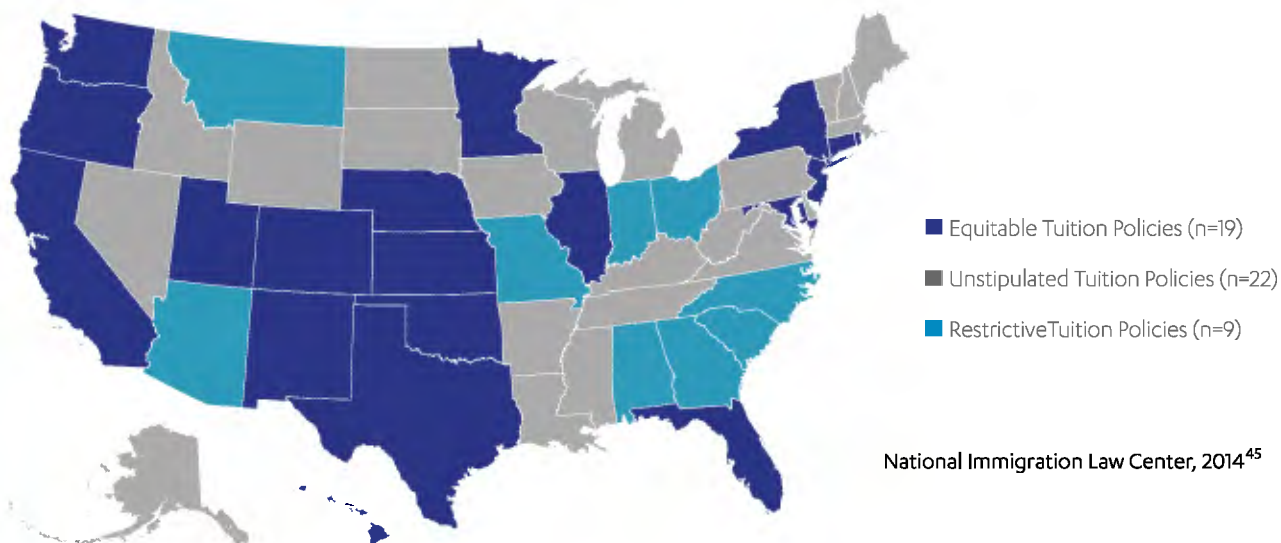
Figure 9. Students who Indicated They would Apply for U.S. Citizenship if Eligible



Thus, receiving a provisional status like DACA appears to have reinforced a deep seated desire to belong in American society. These findings point to the ways in which undocumented students view DACA as an opportunity for engaging and contributing to American society. Research demonstrates their desire to engage civically in ways not always fully detected by traditional measures of civic engagement. This is important to note considering the popular perception that immigrants have low levels of civic engagement or are only motivated to attain citizenship for its instrumental value. Our data reveal a deep vein of longing for citizenship as a marker of belonging to the only country they truly know.

The Limitations of DACA

While the students reported many benefits of DACA, our data also pointed to some notable limitations for addressing structural barriers that impact access and success for undocumented students generally. From the students' point of view, there are barriers associated with the provisional nature of DACA, lack of clarity and misinformation about what DACA means, concerns about the vulnerabilities of loved ones, and lack of consistency in implementation of the rules across states and institutions – which all can generate new anxieties and ambiguities. To this point, it is important to acknowledge that whether or not undocumented students will pay in-state or out-of-state tuition, if they can gain access to certain forms of financial aid, and in some cases, if they can enroll in institutions in certain states are governed at the state, higher education

Figure 10. Differences in In-State Tuition Policies for Undocumented Students

Note: States with equitable tuition policies explicitly grant in-state tuition and/or eligibility for state grant aid for undocumented students; States with unstipulated tuition policies do not have policy that explicitly address access to in-state tuition for undocumented students. States with restrictive tuition policies explicitly prohibit access in-state tuition and/or enrollment for undocumented students.

system and institutional levels. While some institutional and state settings have developed inclusive policies and practices, there are also settings with highly exclusionary policies and practices.

“Because DACA provides benefits that have never been given to undocumented youth, there are a lot of misconceptions about the new rights and opportunities we have.”

[Male from Massachusetts attending a 4-year private college]

In-State Tuition and Enrollment Policies

A very high concentration of respondents (76.9%) reported moderate to extreme concerns about financing their education, which was greater than what was found in a national study of four-year college students (67.8%).⁴⁰ The high level of concern among our respondents about the cost of higher education is not surprising considering the rapidly shifting landscape for how different states and institutions treat undocumented students, with some that have developed more inclusive tuition and aid policies and practices, while others have established more exclusionary ones.

At the state level, for example, in-state tuition policies vary from one state to another. This is important given that the

average out-of-state tuition rate at public four-year colleges is more than double the rate of in-state tuition (\$22,958 vs. \$9,139).⁴¹ Currently, 19 states have tuition equity policies for undocumented students (see Figure 10).⁴² In most of these cases, in-state tuition for undocumented students was approved through policy decisions at the state level (e.g., legislation).⁴³ Furthermore, nine states restrict undocumented students from accessing in-state tuition (Alabama, Arizona, Georgia, Indiana, Ohio, Missouri, Montana, North Carolina, South Carolina).⁴⁴ In most cases, states have unstipulated aid policies for undocumented students. Simply put, undocumented students, and the higher education community alike, are affected by a particularly high degree of variability in tuition policies between states, as well as for DACA recipients and non-recipients.

Regardless of state tuition policies, it is important to note the fact that tuition policies also vary widely across different institutions. Some colleges have tuition equity policies for undocumented students that were approved through their Board of Regents. For example, the University of Hawai'i Board of Regents and the Rhode Island Board of Governors for Higher Education passed tuition equity policies for undocumented students.⁴⁶ In addition, the University of Michigan Board of Regents passed tuition equity policies for undocumented students within three university campuses (this does not include all public postsecondary institutions in MI).⁴⁷

For the most part, states and institutions have been left with the task of deciding how DACA recipients should be treated given their unique and liminal status. In some cases, there are states that recognize DACA as proof of residency for in-state tuition policies. For example, in 2014, the state of Virginia extended in-state tuition only to DACA recipients. There are also examples where institutions are explicitly offering in-state tuition for undocumented students with DACA, regardless of state legislation (e.g., public higher education systems in Ohio and Massachusetts).⁴⁸ Arizona, Maricopa and Pima community college districts, in particular, are explicitly providing in-state tuition for undocumented students with DACA even though the state of Arizona has prohibited in-state tuition for undocumented students. It is important to note that there are three states that not only do not allow in-state tuition for undocumented students, but also have restrictive enrollment policies (i.e., Alabama, Georgia, and South Carolina). Interestingly, although Alabama restricts undocumented students from receiving in-state tuition and enrolling in public colleges, DACA recipients are allowed to enroll in community colleges and some universities at in-state tuition rates.

Differential Tuition Policies

Tuition policies for in-state and out-of-state residents in public colleges and universities vary widely between different states, higher education systems, and institutions, and the ambiguity of these policies is not unique to undocumented students. In some states, public colleges and universities have “good neighbor provisions” for out-of-state residents to pay in-state tuition. For example, in Nevada, while there is a state provision to provide in-state tuition for residents of 10 counties in California, they do not have an explicit tuition policy for undocumented students, even if they are residents of Nevada. In some states, there are even provisions that afford residents of Canada or Mexico to pay in-state tuition. These provisions can be models for public colleges and universities in states with unstipulated tuition policies for undocumented students.

In addition to tuition policies, college affordability is also affected by access to financial aid. *All forms of federal grants and loans are unavailable to undocumented students regardless of whether or not they have DACA.* As a result, access to grants or loans for undocumented students is relegated to what is

accessible to them from states and/or institutions and this varies highly from one setting to another. While DACA has not afforded students with access to in-state aid, there are five states that offer access to state grants for undocumented students through state legislative action (i.e., California, Colorado, New Mexico, Texas, and Washington).⁴⁹

In addition to states varying in their aid policies for undocumented students, institutions also vary in their support for undocumented students.⁵⁰ While some institutions are explicitly offering institutional support for undocumented students, these are mostly selective private universities and religiously affiliated colleges. Most institutions utilize a don’t ask, don’t tell policy, meaning they do not inquire about who their undocumented students are, and do not have an explicit policy around financial support for undocumented students, though they may offer financial aid on a case-by-case basis. In some cases, institutions classify and treat undocumented students as international students, which results in augmented tuition rates.

Respondents attending four-year institutions were more likely to have grants or scholarships compared to students attending community colleges (78.7% vs. 53.2% respectively). Conversely, students attending community colleges were more likely to be paying out-of-pocket for college compared to students attending four-year institutions (30.4% vs. 15.2% respectively). However, almost no students (0.9%) were getting access to loans. These findings demonstrate the ways in which state and institutional contexts matter for undocumented students.

Higher education non-profit organizations, advocacy groups, and scholarship providers also lack consistency in their engagement with undocumented students. One example is the treatment of undocumented students by scholarship and internship providers, which lack guidance on how to provide opportunities for undocumented students. This often results in ambiguous information about eligibility for different programs, which needs to be more clearly addressed. A student described how this plays out when he attends career fairs on campus, “[At] career fairs, the campus employment center does not make companies that come on campus knowledgeable on what DACA does, so they are very unlikely to hire an undocumented student with DACA” [Male from Illinois attending a 4-year private college].

The provisional nature of DACA is a major concern for students

For many of these hard working, ambitious young people, the uncertainties about the future loomed large. One participant noted two particular concerns, *“Worrying about future employment, and coming out to employers as undocumented”* [Male from New York attending a public 4-year public college]. Others worried about the ongoing uncontrollable impediments and obstacles they were facing: *“It is difficult to know I am being held back by something outside of my control”* [Female from Arizona attending a 4-year public college]. As such, as one young woman so clearly explained, *“It is not just stressful but also depressing for any human not being able or motivated to think, dream, and plan a future”* [Female from New York attending a 4-year public college].

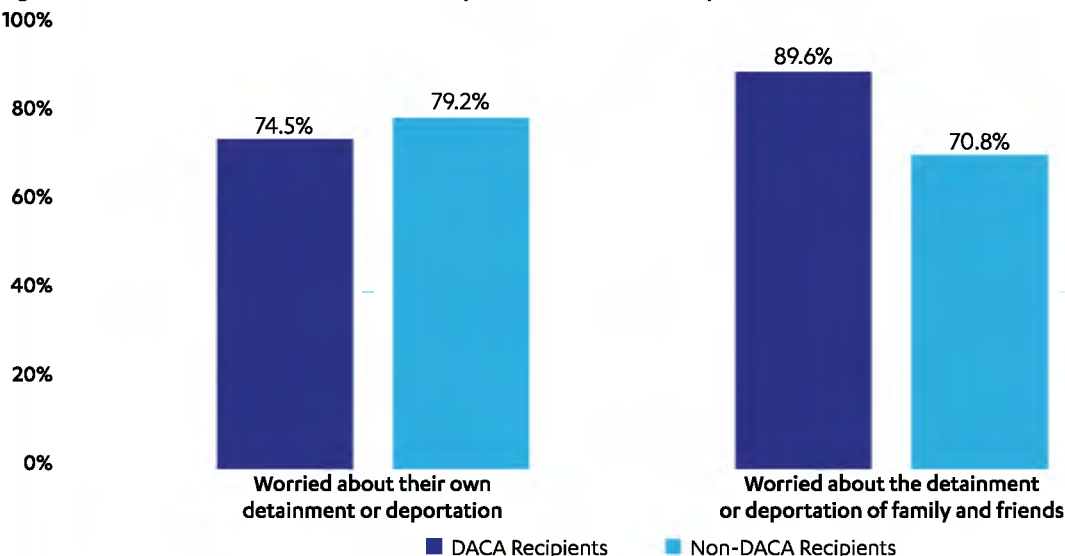
While DACA has been an important first step in bringing undocumented college students towards a sense of resolution, for many, the question remains as one simply summarized as: *“What will happen when DACA ends?”* [Male from New Jersey attending a 4-year public college]. Their status and future remains in limbo; as a young man from New Jersey attending a 4-year private college explained his state of mind, *“I live with a cloud of uncertainty over me at all times.”*

Worrying about who is in and who is out

For both DACA recipients and non-recipients, worries about deportation and detention was a prevailing issue fueling their anxieties. Ironically, DACA did not erase these concerns, and in fact drove a paradox in the data. Participants were asked about how often they worried about detention and deportation for themselves and separately for their loved ones. An advantage of DACA should be an alleviation of concerns of their own deportation as this is one of its inherent benefits. Somewhat surprisingly, nearly three-quarters (74.5%) of DACA recipients continued to report concerns about his or her own deportation in comparison to 79.2% of DACA non-recipients (Figure 11). The legal protections do not significantly obliterate worries about deportation, although DACA recipients were less likely to report being worried about this “most” of the time and more likely to report being worried “a little of the time” compared to non-DACA recipients.

Residual worries about deportation are even more apparent when considering the response to the question about concerns surrounding deportation of family or friends. While 70.8% of non-DACA recipients reported worrying about the deportation or detention of friends and family, a higher proportion of DACA recipients (89.6%) reported ongoing worries about this. Therefore it appears that for DACA recipients crossing over to the safety that DACA affords comes at a cost; a hyper-awareness of the vulnerability of loved ones left behind the line of the DACA threshold.

Figure 11. Concerns about Detainment or Deportation of Self, Family, or Friends



"I am afraid of my parents being deported on any random day."

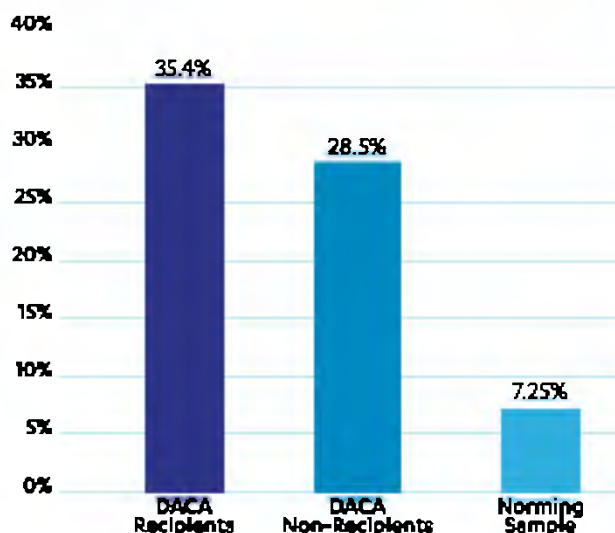
[Male from California attending a public 2-year college]



Students reported the paradox of feeling personally safer because of DACA, but having greater concerns for their family members. As one student explained, *"DACA has given me the opportunity to feel a bit more protected from deportation. However my mom, family members, and thousands of community members don't have that opportunity. Every day I worry if my mom is going to come home safe. It's very hard to focus and do my best in school when I have to worry about how to keep my family together"* [Female from Washington attending a 4-year private college].

Indeed, this heightened anxiety for loved ones along with the liminal nature of DACA status might be what accounted for a particularly surprising finding of this study. While we expected the anxiety levels of DACA recipients to be lower than those of non-DACA recipients, in fact they were elevated. We found that 35.4% of students with DACA reported anxiety rates above the clinical cut-off point in comparison to 28.0% of non-DACA recipients (see Figure 12).

Figure 12. Students Meeting the GAD-7 Clinical Cutoff for Anxiety



THE CAMPUS EXPERIENCE

In addition to identifying how undocumented students were affected by the policy context, we were interested in learning more about the experiences of students within different campus settings, the extent to which they have unique needs and challenges as college students, and whether or not higher education practitioners are providing support to address these issues. In this section, we discuss how students are affected by their unique financial barriers, their experiences with campus climate, and provide a discussion about the important role of higher education practitioners.

Contending with Unique and Multiple Barriers

Undocumented students face a number of unique barriers that impact their ability to attend and succeed in college. A prevailing concern for many of the participants was how to finance their education. Over half (56.7%) reported being extremely concerned about financing their college education. This was reflected in the factors that contributed to their choice of college. The two most significant factors in the college choice process for our respondents were cost and location (Figure 13). This is significantly different than what is reported in national surveys of the factors that contribute to the college choice process, where students report the reputation and ranking of the institution as their most important factors in their decisions.

Almost a third (29.0%) reported being extremely concerned about their ability to buy textbooks and necessary class materials. The concerns about financing their education

and being able to afford class material was greater among students attending college in states that do not have state DREAM Acts, compared to students attending colleges that do have state DREAM Acts (Figure 14, next page).

A very high proportion of our respondents (72.4%) worked while attending college. Community college students were only slightly more likely (75.6%) to work than respondents in four-year colleges (69.4%). Students mentioned the stresses of working long hours and managing full academic schedules. *“Being a full-time student while also working 45+ hours a week in order to afford school makes things much more stressful”* [Female from New York attending a public 2-year college]. A greater proportion of students worked off-campus (60.2%), compared to students who reported working on-campus (30.9%). However, it is also important to note that 14.1% of students reported having worked both off- and on-campus

Figure 13. Factors that Contributed to the Decision to Attend their College

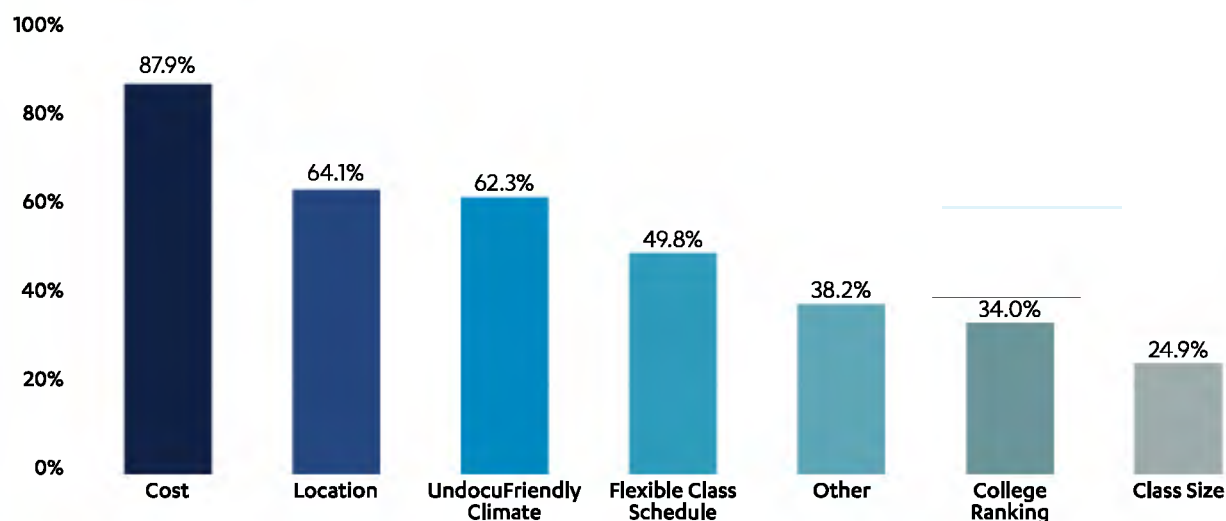
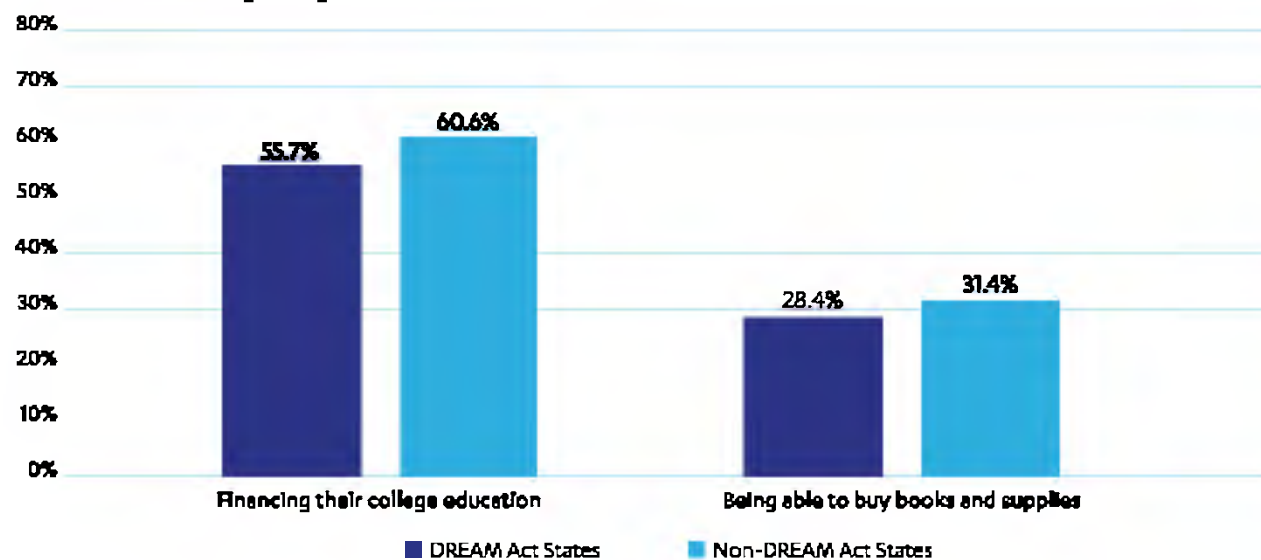
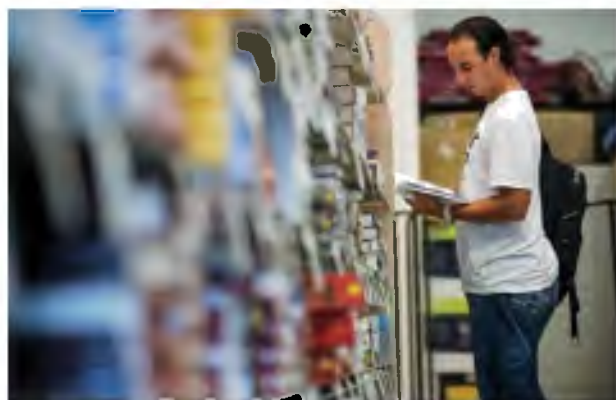


Figure 14. Differences In Concerns about Financing Education and Buying Books and Supplies for Students Attending College in States with and without State DREAM Acts



in the previous month. Working while in college led to worries about being a successful student; *"Working so much has made staying in school difficult and it also makes being good at school difficult"* [Female from Wisconsin attending a 4-year public college]. Almost seventeen percent (16.7%) of respondents report being enrolled in college part-time. Of those who enrolled as part-time students, 80.9% reported that this was due to financial considerations.



Financial concerns led 15.1% of respondents to take a leave of absence from school. Of those who stopped-out, 73.9% reported that it was due to financial difficulties. The issues that led to leaving school were often confounded by other challenges in their lives. As one participant explained, *"The first time [the student stopped-out] was because of financial difficulties; the other two times are due to psychological issues"* [Female from California attending a 4-year public college]. Another wrote of her multiple challenges, *"I had constant*

trouble affording college tuition, and I was also detained by Homeland Security/I.C.E for a total of three weeks. I was forced to drop all of my classes" [Female from California attending a 4-year public college]. In brief, the precarious legal status of undocumented students throws multiple obstacles in their lives and in their path to college success.

Not surprisingly, given these financial vulnerabilities, participants want campuses to recognize their substantial academic efforts and to help support them moving forward: *"I want them to provide more support for undocumented students by offering resources to pay for college in the form of scholarships"* [Female from Illinois attending a public 2-year college]. In many cases, students were also seeking opportunities for internships: *"Provide a program that helps undocumented students find scholarships and internships that they can qualify for, to lessen the financial burden, and to feel like they have a chance at those experiences"* [Female from Iowa attending a 4-year public college].

Campus Climate and the Need for Safe Spaces

Some of the undocumented students spoke of their sense of isolation on campus as they felt uncertain about who they could trust, *"One of the biggest challenges is knowing who I can turn to for help to understand my undocumented status as a college student"* [Male from California attending a 4-year public college]. *"Not having a safe space where I can express*

my feelings about being undocumented” [Female from Illinois attending a public 2-year college]. *“Finding people that I connect with and people I can trust”* [Female from California attending a 4-year public college].

Students also reported on the extent to which they were treated unfairly or negatively due to their legal status by faculty, counselors, other students, financial aid officers, campus administrators, and security guards/campus police (Figure 15, below). Students attending four-year institutions were more likely than students attending 2-year colleges to report a higher level of unfair or negative treatment by other students and campus administrators. Students attending 2-year public institutions reported a higher level of unfair or negative treatment by financial aid officials.

“Realize that you have a very important influence on students, especially undocumented students. So be sensitive, nonjudgmental, patient, motivating, and above all a person that’s approachable and trustworthy.”

[Male from California attending a public 2-year college]

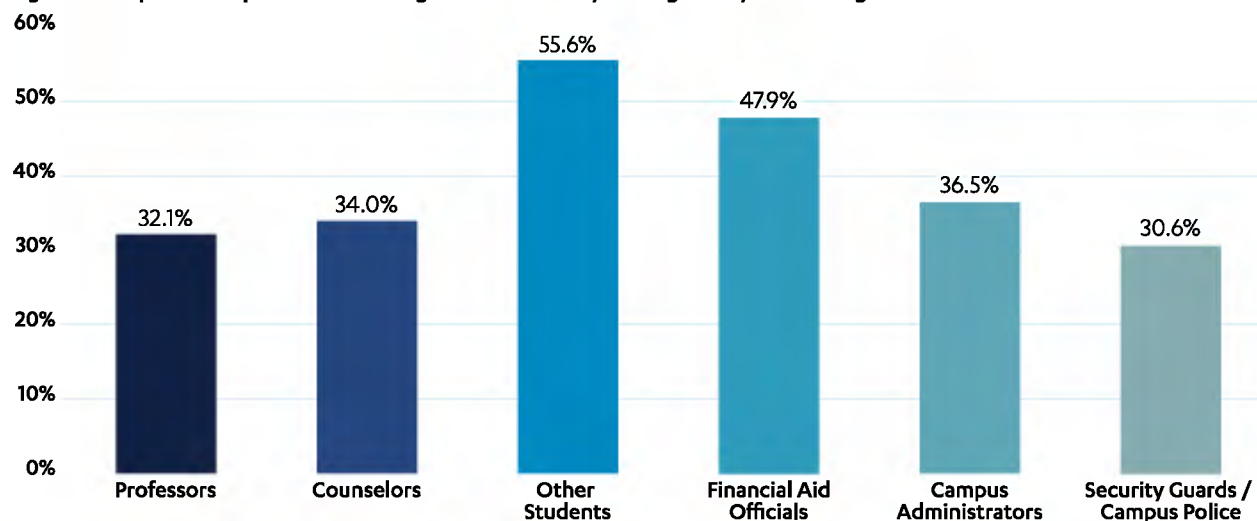
Many of the respondents reported a desire for administrators to listen to their stories, experiences, and concerns. Repeatedly we heard a version of: *“Listen to the student population. If there are students who are openly declaring their status, have a conversation with them”* [Female from Illinois attending a 4-year public college] or *“I think the biggest thing*

is to listen to us – there’s a very real chance that the administrators in question have no idea what [undocumented students] go through. None at all. So listening and hearing what we’re going through is half of the battle” [Transgender from California attending a 4-year public college].

A very tangible, actionable recommendation that students requested was the provision of a safe zone on campus. Many students discussed the importance of safe spaces (e.g., resource centers or support groups on campus). As one student explained, *“Make a student center [for undocumented students]. A lot of schools have an LGBT office in which LGBT students come and talk about their issues. It would be great if there is any support system on campuses”* [Male from New York attending a 4-year public college]. These spaces were clearly important to provide a refuge in an unsafe world, *“It would be great if campuses could have a place where students can feel safe and are not targeted”* [Male from Colorado attending a 4-year public college]. These safe zones were also recommended as sources of information. *“There should be more clubs. Those clubs should focus on providing moral support along with information”* [Female from California attending a 4-year public college]. Of students who had access to these spaces on their campuses, 73.1% reported utilizing these resources (Figure 16).

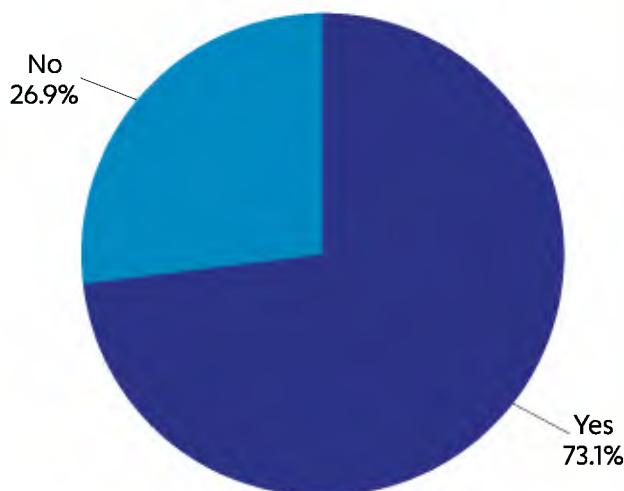
In addition to formal campus organization, some participants suggested that it would be helpful for allies of undocumented students on campus to display symbols of solidarity. In the traditions of the early days of the gay rights movement, these symbols signal undocumented undergraduates that certain spaces and people are safe to exchange information: *“I would feel safe if there were signs or maybe even a poster*

Figure 15. Reported Experience of Being treated Unfairly or Negatively due to Legal Status



showing their support for students who are undocumented... if I saw posters like that, I would feel more comfortable sharing my status not only with the counselors but also the professors.” [Female from California attending a 2-year public college].

Figure 16. Made Use of Organizations, Centers, or Safe Spaces Where Undocumented Students can Gather to Share Experiences (for Students Who Had Access to Them)



Many of undocumented undergraduates also asked that college administrators become allies of undocumented students on campus by recognizing undocumented undergraduates as part of the campus community: “Administrators should recognize that undocumented students exist, and contribute to the lively nature of college campuses enriching their academic and social environments in ways that they can hardly begin to imagine” [Male from Connecticut attending a 4-year private college]. Others asked for more than simple acknowledgment: “I wish college administrators would openly embrace us and support us” [Female from California attending a 4-year public college] and “make us feel like part of the student body” [Male from Florida attending a 2-year public college].

A number of undocumented undergraduates specifically asked for administrators to act as advocates by actively making a public statement endorsing of undocumented undergraduates both inside and beyond the campus. As one student simply said: “I would want [administrators] to publically state they support undocumented students” [Female from Illinois attending a 2-year public college]. Another, student explained in more detail: “I will recommend them taking the risk in being supportive of ALL students. At the end of this period, when we look at the fight for immigrant rights and the fight against family separations as something like the civil

rights movement, will they be looked at as an institution that stood on the right side of the fight? Will they be seen as an institution that took that risk, despite the negative climate?” [Female from Illinois attending a 4-year public college].

CREATING AN ‘UNDOCUFRIENDLY’ CAMPUS

- ✓ Listen & Learn
- ✓ Be Empathetic
- ✓ Publicly Endorse Undocumented Students
- ✓ Train Faculty and Staff about Undocumented Students
- ✓ Provide Equity of Treatment
- ✓ Respect Undocumented Students’ Privacy
- ✓ Provide Safe Zones for Undocumented Students
- ✓ Provide Information to Undocumented Students
- ✓ Provide Financial Support for Undocumented Students
- ✓ Provide Counseling to Undocumented Students

LESSONS LEARNED AND LOOKING AHEAD

This nationwide survey was a unique opportunity to hear the voices of undocumented undergraduates attending an array of campuses. Beyond learning about them, their shared characteristics as well as their heterogeneity, a number of recommendations emerged that are relevant to policymakers, colleges and universities, and higher education association providers.

Implications for Policymakers

- Considering recent executive action will create employment authorization for more than 3.9 million tax-paying undocumented residents who will generate an estimated \$4 billion in new tax revenue, states should offer equitable tuition policies for undocumented students. The review of these policies is especially important for the states with unstipulated tuition policies and the nine states with restrictive tuition policies.
- The federal government should provide clear guidelines for ways the higher education community could better serve DACA students regarding work authorization, internships, and access to scholarships.
- There is a need to reexamine federal and state financial aid guidelines for both undocumented students and citizen and lawful permanent resident children of undocumented parents. For the latter group, procedures need to reflect changes to work authorization for undocumented adults with citizen and lawful permanent resident children.
- There is a need within the higher education community for an on-going dialogue to inform admissions and outreach, financial aid, transition programs, student support services, retention programs, and efforts to assist students with pursuing graduate school or careers.
- It is particularly important for higher education institutions and systems to review and, if necessary, revise procedures related to DACA, including employment, internships, and study abroad.
- Faculty should anticipate having undocumented students in their academic programs, in their classrooms, and as advisees, be aware of their unique barriers and challenges, and be knowledgeable about resources on campus that can respond to their needs.
- Colleges and universities should be sites for legal clinics and other consultation services for undocumented residents in their local communities regarding DACA and other immigration matters. This affords current and aspiring law students with valuable, first-hand experience and the opportunity to serve their local communities. CUNY's Citizenship Now is a model for such practice (<http://www.cuny.edu/about/resources/citizenship.html>)

Implications for Colleges and Universities

- Higher education institutions should proclaim their commitment to and support for undocumented students as members of their campus communities. This endorsement should reflect their commitment to welcome, embrace, recognize, acknowledge, and provide a safe space for these students.
- Colleges and universities should provide counseling supports and mental health services on campus provided by culturally responsive service providers.

Implications for Higher Education Associations, Scholarship Providers, Foundations, and Corporations

- Higher education associations and community advocacy groups should be the front-line providers for their constituents about how to navigate the process of gaining access to and succeeding in college.
- There is a need for philanthropy to engage with scholarship providers and the higher education community to develop funding opportunities for undocumented students at the undergraduate and graduate levels.
- Foundations should support research that can generate information about innovative and effective programs and practices.
- Corporations should review their recruitment and hiring practices to afford undocumented students with access to internships and other career opportunities.

GLOSSARY OF TERMS

DACA (2012)

On June 15, 2012, President Barack Obama announced the creation of the Deferred Action for Childhood Arrivals (DACA) initiative, which provides temporary lawful presence to undocumented youth and young adults. This initiative provides new opportunities to undocumented youth who came to the U.S. before the age of 16, have lived in the U.S. continuously for at least five years, and have graduated from high school or obtained a GED. Eligible recipients can request a temporary 2-year reprieve from deportation and apply for a work permit.

DACA (2014)

On November 2014, President Obama expanded DACA to allow individuals born prior to June 15, 1981 to apply for DACA. Additionally, DACA will now last three years rather than two.

DAPA

On November 2014, President Obama announced Deferred Action for Parental Accountability (DAPA) which temporarily defers deportations from the U.S. for eligible undocumented parents of U.S. citizens or lawful permanent residents, granting them access to renewable three-year work permits and Social Security numbers.

Stop-outs

The term “stop-out” refers to students that leave school for a semester or two and return at a certain period when circumstances allow.

Undocumented Immigrants

Foreign-born immigrants who do not have authorized status via U.S. citizenship, lawful permanent residence, or through visas, asylum or refugee status. Those with DACA are still undocumented, but now have temporary lawful presence in the U.S. Also referred to as unauthorized immigrants.

International Students

International students are college students who are not citizens or permanent residents of the U.S. Typically, international students have lawful presence via student visas and remain residents of their country of origin and do not intend to give up their birth citizenship. Undocumented students are not international students because they do not have authorized student visas and have resided in the U.S. for a number of years. Some international students can become undocumented if they overstay their visas after they expire.

TECHNICAL APPENDIX

General Description of Recruitment

In order to recruit participants from this ‘hard to reach’ population we used a variety of recruitment strategies, including the UndocuScholars website portal (undocuscholars.org), our Community Advisory Board organization contacts, contacts at campuses across the nation, social media, posters displayed on campuses at various schools, as well as our research team and Student Advisors recruiting in-person at a number of DACA events.

The criteria for inclusion in the sample were that potential participants reported being undocumented, being an undergraduate student (or currently taking a break but having been an undergraduate student within the last 12 months), and being no more than 30 years of age. Paper versions of the surveys were distributed for completion at various events or provided to key contacts, otherwise respondents used the online version of the survey, accessible via the UndocuScholars website.

Sample. The aim of the data collection was to capture a broad sample of the population to represent the range of demographic characteristics (such as ethnicity and country of origination) as well as the types of colleges they attend, across the U.S. The nature of the population— undocumented undergraduates—renders random sampling an impossibility. We recognize the limits of our sampling strategy and cannot claim that it is representative of all undocumented undergraduates. We strove to consider the ways in which it might reflect the general undocumented college population given what we know based on available benchmarks. We used two recent studies as these benchmarks one recently released by the Migration Policy Institute (2014)⁵¹ and the other by the Immigration Policy Center (2012).⁵²

DACA status. All of the participants in the study were within the DACA-eligible age range, had completed high school in the U.S and were enrolled in college. As such, the majority was likely to be eligible for DACA. We asked our participants if they had applied for and received DACA. Indeed, 65.9% applied for and received DACA and 16.0% indicated they did not qualify (for various reasons, such as they had not been continuously in the U.S. for 5 years). A

remaining 11.6% thought they might qualify but had not applied and 1.6% were in the application process or had been refused. There was missing data for the remaining 5.3%. Those that did not apply were more likely to be male and to attend community college. Otherwise there were no obvious distinguishing demographic characteristics.

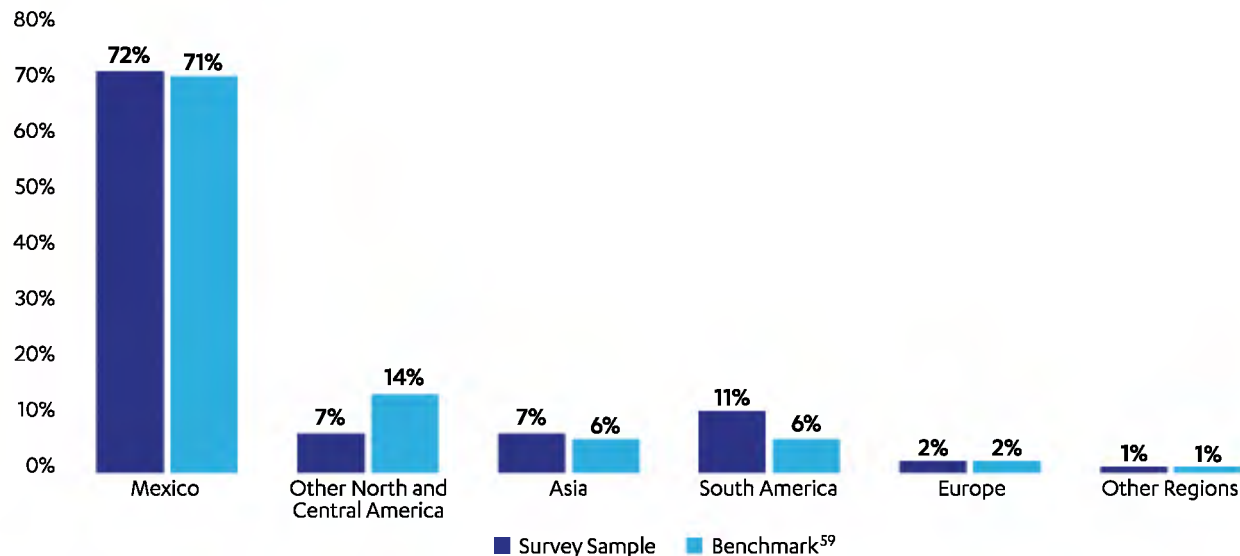
Country/region of origin. The countries of origin of the survey respondents were as follows:

Table 2: Countries of Origin of Survey Respondents by Frequency

Countries of Origin of Survey Respondents (Frequency)	
Mexico (657)	Iraq (2)
Peru (27)	Jordan (2)
South Korea (27)	Mongolia (2)
Columbia (24)	Poland (2)
Guatemala (19)	Bulgaria (1)
El Salvador (18)	Czech Republic (1)
Argentina (17)	Dominican Republic (1)
Philippines (13)	Italy (1)
Brazil (9)	Malaysia (1)
Venezuela (7)	Mauritius (1)
Honduras (6)	Nepal (1)
India (6)	Nicaragua (1)
Chile (5)	Pakistan (1)
Costa Rica (5)	Panama (1)
Cuba (5)	Paraguay (1)
China (4)	Republic of Congo (1)
Ecuador (4)	Romania (1)
Lithuania (4)	Samoa (1)
Spain (4)	Saudi Arabia (1)
Indonesia (3)	South Africa (1)
Jamaica (3)	Taiwan (1)
Kenya (3)	Trinidad and Tobago (1)
Thailand (3)	Ukraine (1)
Algeria (2)	Uruguay (1)
Belize (2)	Vietnam (1)
Bolivia (2)	

Comparing the figures for our sample and the “Dreamers” population (Figure 17, following) reveals that the proportions of Mexicans, Asians, Europeans, and people from other regions are very similar to the benchmark population.⁵³ However, our sample is slightly overrepresented with those from South America and underrepresented with those from Central America.

Gender. Females are somewhat overrepresented. 53.5% of the sample is female, compared to a benchmark estimate of 46.1% of DACA eligible youth.⁵⁴ This may reflect the fact that females are more likely to attend college⁵⁵ and to respond to surveys than males.

Figure 17. Comparison of Regions of Origin Between Sample and Benchmark

Pre-college academic characteristics. Prior to attending college, 83.4% of the participants had attended public schools. Another 5.8% attended charter schools or magnet schools. 1.2% had attended exam/selective schools. Only 9.4% attended private or parochial schools. According to the Higher Education Research Institute, 72.7% of their national sample of four-year college students took at least one Advanced Placement (AP) course. In contrast, fifty-five percent of our sample had taken AP or honors classes during high school.⁵⁶

College type. Students from all college types were recruited into the sample, including two- and four-year colleges, public and private institutions, and colleges with a range of selectivity. In our sample, 41.3% of respondents were at community colleges, 46.9% were at 4-year public colleges and 9.1% were at 4-year private colleges, while 2.8% were currently taking a break from college. Thus, students from 4-year colleges are overrepresented, based on the benchmark compared to 70% of immigrant undergraduates enrolled in California 2-year colleges.

State of residence. While this study provides a broad representation, it is not balanced by state.⁵⁷ Nonetheless, Table 3 shows there is broad overlap between the states with the most responses to the survey and the states with the highest estimated number of DACA eligible college students.

Table 3: Top States by number of respondents & DACA eligible college students

Survey Responses	Benchmark Population
California	California
Illinois	Texas
Texas	New York
Arizona	Florida
New York	Illinois
Washington	New Jersey
New Jersey	Georgia
Massachusetts	Virginia
Florida	Massachusetts
Colorado	North Carolina
Georgia	Arizona

The highest response rates relative to the population of undocumented college students (estimated based on DACA eligibility) were in Arizona, Illinois, California and Washington.⁵⁸ Not unexpectedly, we had low response rates either in states where there are low estimates of DACA eligible students as well as in states that have particularly exclusionary policies where undocumented college students may feel particularly silenced and vulnerable. Thus, we are not fully capturing these students' perspectives or difficulties.

Analysis Procedure

A key aim of the data collection strategy was to protect the identities of survey respondents. However, the anonymity that was afforded respondents had an unfortunate corollary, namely a large number of mischievous responses⁵⁹ to the online version of the survey. Of the over 3,500 responses received in total, more than 70% were identified as being mischievous, either having been generated by computer

programs or 'made up' by individuals, presumably with the aim of profiting from the \$20 Amazon gift voucher. This data collection issue was recognized early in the data collection process and a procedure was developed to systematically assess the genuineness of each response. First, responses were reviewed and where appropriate, were flagged as suspect based on multiple criteria, including, for example, the time taken for the survey to be completed (less than 10 minutes), lack of internal consistency e.g. between home language and country of birth or between college name, state of residence and college location, repeated verbatim qualitative responses for multiple cases in a proximate period of time, etc. Responses flagged as suspect were then reviewed by a team and a consensus decision was made. This systematic process gives us confidence in asserting that the final sample of 909 responses consists exclusively of responses that are legitimate, and that as far as possible, legitimate responses were not excluded from the final sample. The assessment of legitimacy was carried out independently of any analysis of the survey results.

The preliminary analyses presented in this report are based on quantitative descriptive analyses of forced-choice survey items and qualitative analyses to the open-ended survey questions. The analyses were conducted with SPSS with data from Qualtrics. The descriptive statistics provided are primarily the means of relevant continuous variables and for the categorical variables, the percentage of respondents (from the whole sample or by DACA status) who responded as indicated.

The percentage differences reported for DACA versus non-DACA students have been assessed using logistic regression to ensure that these results are not being driven by differences in basic demographic characteristics including ethnicity, age, gender and college-type. To assess the levels of anxiety among this population, the Generalized Anxiety Disorder-7 was used for the study. This 7 item scale includes items like: "Over the last 2 weeks how often have you been bothered by: Not being able to stop or control worrying." Participants respond on a 4 point Likert scale ranging from not at all to nearly every day. Items are summed with possible scores ranging from 0 to 21; the clinical cut off score in the national norming sample based on a large diverse population of 2,182 individuals was determined in the norming sample to be 10.

Qualitative codes were inductively developed based on 100 randomly selected responses. The categories that emerged were defined and a team of coders were trained on the coding definitions. Responses could be assigned multiple codes. Coding was facilitated using MAXQDA software which facilitated searching for codes, quantification of codes, and cross-analysis with survey responses.

ENDNOTES

1. M. Olivas, "IIRIRA, the Dream Act, and Undocumented College Student Residency" *Journal of College and University Law*, 30 (2004): 435-464; S. Flores, "State Dream Acts: The Effect of In-State Resident Tuition Policies and Undocumented Latino Students," *The Review of Higher Education*, 33, no. 2 (2010): 239-283.
2. R. G. Gonzales, C. Suárez-Orozco, & M. C. Dedios-Sanguinetti, (2013). No Place to Belong: Contextualizing Concepts of Mental Health among Undocumented Immigrant Youth in the United States," *American Behavioral Scientist*, 57, no. 8 (2013): 1174-1199; C. Suárez-Orozco, H. Yoshikawa, R.T. Teranishi, & M. Suárez-Orozco, "Living in the Shadows: The Developmental Implications of Undocumented Status," *Harvard Education Review*, 81, no. 3 (2011): 438-472.
3. To be eligible for DACA 2012, individuals were required to: 1) be between the ages of 15 and 30 as of June 15, 2012, 2) have come to the U.S. before the age of 16, 3) have spent at least five continuous years in the U.S., 4) be attending high school or have a high school diploma (or equivalent) or be a veteran of the U.S. armed forces or Coast Guard, and 5) have not been convicted of a felony or significant misdemeanor, and do not pose a threat to public safety or national security.
4. American Immigration Council. *A Guide to the Immigration Accountability Executive Action* (Washington, D.C.: Author, 2014).
5. R. G. Gonzales, *Young Lives on Hold: The College Dream of Undocumented Students* (Washington, DC: College Board, 2009); K. J. Dougherty, H. K. Nienhusser, & B. E. Vega, "Undocumented Immigrants and State Higher Education Policy: The Politics of In-State Tuition Eligibility in Texas and Arizona," *Review of Higher Education*, 34, no. 1 (2010): 123-173; S. M. Flores, & J. Chapa, "Latino Immigrant Access to Higher Education in a Bipolar Context Reception," *Journal of Hispanic Higher Education*, 8, no. 1 (2009): 90-109; R. Teranishi, C. Suárez-Orozco, & M. Suárez-Orozco, "Immigrants in Community College: Toward Greater Knowledge and Awareness," *The Future of Children*, 21, no. 1 (2011): 153-169.
6. J. S. Passel, D. Cohn, J. M Krogstad & A. Gonzalez-Barerra. *As Growth Stalls Unauthorized Immigrant Population Becomes More Stable* (Washington, DC: Pew Hispanic Center, 2014).
7. A. Singer, & N. P. Svajlenka, *Immigration Facts: Deferred Action for Childhood Arrivals (DACA)* (Washington, DC: Brookings Metropolitan Policy Program, 2013).
8. Suárez-Orozco, et al., *Living in the Shadows*, (2011).
9. M. H. Lopez, Director of Hispanic Research, Pew Center, personal communication, Washington, DC, February 7, 2014.
10. *Ibid.*
11. Suárez-Orozco, et al., *Living in the Shadows*, (2011).
12. T. Bailey, *Rethinking Developmental Education in Community College* (New York, NY: Community College Research Center, 2009); R. Fry, *Latino Youth Finishing College: The Role of Selective Pathways*, (Washington, DC: Pew Hispanic Center, 2004).
13. R. Capps, R. M. Castaneda, A. Chaudry, & R. Santos, *Paying the Price: The Impact of Immigration Raids on America's Children* (Washington, DC: Urban Institute, 2007); Suárez-Orozco, et al., *Living in the Shadows*, (2011).
14. Gonzales, et al., *No Place to Belong*, (2013).
15. L. J. Abrego, "I Can't Go To College Because I Don't Have Papers": Incorporation Patterns of Latino Undocumented Youth," *Latino Studies*, 4, no. 3 (2006): 212-231; Gonzales, *Young Lives on Hold*, (2009); C. Suárez-Orozco, M. Suárez-Orozco, & I. Todorova, *Learning a New Land: Immigrant Students in American Society* (Cambridge, MA: Belknap Press of Harvard University Press, 2008).
16. F. Contreras, "Sin Papeles y Rompiendo Barreras: Latino Students and the Challenges of Persisting in College," *Harvard Educational Review*, 79, no. 4 (2009): 610-631; P. A. Perez, "College Choice Process

- of Latino Undocumented Students: Implications for Recruitment and Retention,” *Journal of College Admission*, no. 206 (2010): 21-25; Flores, *State Dream Acts*, (2010); L. D. Garcia, & W. G. Tierney, “Undocumented Immigrants in Higher Education: A Preliminary Analysis,” *Teachers College Record*, 113, no. 12 (2011): 2739-2776; S. M. Muñoz, “I Just Can’t Stand Being Like This Anymore”: Dilemmas, Stressors, and Motivators for Undocumented Mexican Women in Higher Education,” *Journal of Student Affairs Research and Practice*, 50, no. 3 (2013): 233-249; H. K. Nienhusser, “Role of High Schools in Undocumented Students’ College Choice,” *Educational Policy Analysis Archives*, 21, no. 85 (2013): 1-32.
17. Perez, *College Choice Process of Latino Undocumented Students*, (2010); L. D. Garcia et al., “Undocumented Immigrants in Higher Education,” (2011).
 18. W. Perez, *We ARE Americans: Undocumented Students Pursuing The American Dream* (Sterling, VA: Stylus Publishing, 2009); W. Perez, R. Espinoza, K. Ramos, H. Coronado, & R. Cortes, “Academic Resilience Among Undocumented Latino Students,” *Hispanic Journal of Behavioral Sciences*, 31, no. 2 (2009a): 149-181; W. Perez, K. Ramos, H. Coronado, R. Espinoza, & R. Cortes, “Motives for Service: Civic Engagement Patterns of Undocumented Latino Students,” (Unpublished Manuscript); W. Perez, “Higher Education Access for Undocumented Students: Recommendations for Counseling Professionals,” *Journal of College Admission*, no. 206 (2010): 32-35.
 19. G. Kao, & M. Tienda, “Optimism and Achievement: The Educational Performance of Immigrant Youth,” *Social Science Quarterly*, 76, no. 1 (1995): 1-19; C. Suárez-Orozco, & M. Suárez-Orozco, *Children of Immigration* (Cambridge, MA: Harvard University Press, 2001).
 20. D. Conger, & C. Chellman, “Undocumented College Students in the United States: In-State Tuition Not Enough to Ensure Four-Year Degree Completion,” *Education Finance and Policy*, 8, no. 3 (2013): 364-377.
 21. Contreras, “Sin Papeles y Rompiendo Barreras,” (2009).
 22. Gonzales, et al., *No Place to Belong*, (2013); Perez, *We ARE Americans*, (2009); W. Perez, R. Cortes, K. Ramos, & H. Coronado, “Cursed and Blessed”: Examining the Socioemotional and Academic Experiences of Undocumented Latina and Latino College Students,” *New Directions For Student Services*, no. 131 (2010): 35-51; W. Perez, & R. Cortes, *Undocumented Latino College Students: Their Socioemotional and Academic Experiences* (Dallas, TX: LFB Scholarly Publishing, 2011); S. M. Muñoz, & M. M. Maldonado, “Counterstories of College Persistence by Undocumented Mexican Students: Navigating Race, Class, Gender, and Legal Status,” *International Journal of Qualitative Studies in Education*, (2011): 1-23.
 23. Perez, et al., “Cursed and Blessed,” (2010).
 24. Contreras, “Sin Papeles y Rompiendo Barreras,” (2009); Muñoz, “I Just Can’t Stand Being Like This Anymore,” (2013).
 25. R. G. Gonzales, & L. R. Chavez, ‘Awakening To A Nightmare’: Abjectivity and Illegality In The Lives of Undocumented 1.5-Generation Latino Immigrants in the United States,” *Current Anthropology*, 53, no. 3 (2012): 255-281.
 26. Students enrolled in public and private; 2-year and 4-year colleges were included. Students could be enrolled in certificate, AA, AS, AB, BA, or BS programs. Students had to be currently enrolled or have been enrolled within 12 months (in order to capture stop-outs). Graduate students were excluded.
 27. Participants were categorized according to their self-selected racial/ethnic group. Thus a Dominican could classify themselves as Latino or Black. We respected the participant choice in reporting the data.
 28. These age categorizations were selected based on 1.75 (arriving before age 5), 1.5 (arriving between ages 6 and 12) and 1.25 (arriving after age 12) generation designations. From R. Rumbaut. Ages, life stages, and generational cohorts: Decomposing the immigrant first and second generations in the United States, *International Migration Review*, 38, no. 3 (2004): 1160-1205.

29. Center for American Progress, *The Facts On Immigration Today* (Washington, DC: Center for American Progress, 2014).; J. S. Passel, & P. Taylor, *Unauthorized Immigrants and their U.S.-Born Children* (Washington, DC: Pew Hispanic Center, 2010).
30. J. S. Passel & D. Cohn, *Unauthorized Immigrant Population: National and State Trends*, 2010 (Washington, DC: Pew Hispanic Center, 2011).
31. Human Impact Partners, *Family Unity, Family Health: How Family-Focused Immigration Reform Will Mean Better Health for Children and Families* (Oakland, CA: Author, 2013).
32. S. Freed Wessler, *Shattered Families: The Perilous Intersection of Immigration Enforcement and the Child Welfare System* (New York, NY: Applied Research Center, 2011).
33. B. Baker & N. Rytina, *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012* (Washington, DC: Department of Homeland Security, 2013).
34. K. Ramakrishnan & F. Z. Ahmad, *State of Asian Americans and Pacific Islanders' Series: A Multifaceted Portrait of a Growing Population* (Washington, DC: Center for American Progress, 2014).
35. The National Immigration Law Center reports DACA recipients are eligible for driver's licenses in most states (45 states); three states (NM, UT, WA) in particular issue drivers licenses regardless of immigration status. However, some states have restricted DACA recipient's eligibility for driver's licenses.
36. R. G. Gonzales, & A. M. Bautista-Chavez, *Two Years and Counting: Assessing the Growing Power of DACA* (Washington, DC: American Immigration Council, 2014).
37. J. Batalova, S. Hooker, & R. Capps, "DACA at the Two-Year Mark: A National and State Profile of Youth Eligible and Applying for Deferred Action" (Washington, DC: Migration Policy Institute, 2014).
38. We ran multivariate analyses to consider the role of gender, type of campus attended, race, SES, state, and length of time in the U.S. on DACA status and only found a significant relationship for gender and type of campus attended.
39. 55.1% and 12.7% of first-year freshman college students reported "some" and "major" concerns in their ability to finance their education; K. Eagan, J. B. Lozano, S. Hurtado, & M. H. Case, *The American Freshman: National Norms Fall 2013* (Los Angeles, CA: Higher Education Research Institute, UCLA, 2013).
40. College Board, *Trends in College Pricing 2014*. Retrieved from <http://trends.collegeboard.org/sites/default/files/2014-trends-college-pricing-final-web.pdf>
41. H. K. Nienhusser, "Undocumented Immigrants and Higher Education Policy: The Policymaking Environment of New York State," *Review of Higher Education*, 38, no. 2 (2015).
42. Nienhusser, "Undocumented Immigrants and Higher Education Policy" (2015); Institute for Higher Education Law and Governance. Table One. *State Laws Allowing Undocumented College Students to Establish Residency*, 2014, <http://www.law.uh.edu/ihe/g/documents/Statute-TableOne.html> (last visited Nov. 22, 2014).
43. Nienhusser, "Undocumented Immigrants and Higher Education Policy" (2015); Institute for Higher Education Law and Governance. Table Two: *State Restricting Access to Postsecondary Education*, 2014, <http://law.uh.edu/ihe/g/documents/Statute-TableTwo.html> (last visited Dec. 9, 2014).
44. National Immigration Law Center, *Improving Access to Postsecondary Education for Immigrant Students: Resources on State Campaigns for Tuition Equity, Scholarships, and Financial Aid* (Los Angeles, CA: National Immigration Law Center, 2014).
45. Institute for Higher Education Law and Governance. Table one: State laws allowing undocumented college students to establish residency, 2014.

46. *Ibid.*
47. Nienhusser, "Undocumented Immigrants and Higher Education Policy" (2015).
48. *Ibid.*
49. Nienhusser, "Undocumented Immigrants and Higher Education Policy" (2015); National Immigration Law Center, *Improving Access to Postsecondary Education for Immigrant Students: Resources on State Campaigns for Tuition, Equity, Scholarships, and Financial Aid*, 2014 ; uLEAD Network, *National Map-Michigan Policy*. Available at <http://uleadnet.org/map/michigan-policy> (last visited Dec. 10, 2014).
50. Batalova, et al., *DACA at the Two-Year Mark*, (2014).
51. Immigration Policy Center, *Who and Where the DREAMers Are: A Demographic Profile of Immigrants Who Might Benefit from the Obama Administration's Deferred Action Initiative* (Washington, DC: American Immigration Council, 2012)
52. Immigration Policy Center, *Who & Where the Dreamers Are, Revised Estimates*, (2012)
53. Batalova, et al., *DACA at the Two- Year Mark*, (2014).
54. Eagan, et al., *The American Freshman*, (2013).
55. Batalova, et al., *DACA at the Two- Year Mark*, (2014).
56. *Ibid.*
57. J. P. Robinson-Cimpian, "Inaccurate Estimation of Disparities Due to Mischievous Responders Several Suggestions to Assess Conclusions," *Educational Researcher*, 43, no. 4 (2014): 171-185.
58. W. Erisman, & S. Looney, *Opening the Door to the American Dream: Increasing Higher Education Access and Success for Immigrants* (Washington, DC: The Institute for Higher Education Policy, 2007).
59. Immigration Policy Center, *Who & Where the Dreamers Are, Revised Estimates*, (2012).
60. U.S. Department of Education, National Center for Education Statistics, 2011-12 National Postsecondary Student Aid Study (NPSAS:12).

PHOTO CREDITS

Page	Author
Cover	Peter Morenus, 2011.
5	Daniel Miller, 2009. <i>Creative Commons License, NC 2.0</i>
10	QUT Science and Engineering, 2011. <i>Creative Commons License, NC-ND 2.0</i>
11	University of British Columbia Library Communications, 2008 <i>Creative Commons License, NC-ND 2.0</i>
16	Sara Fasullo, 2011 <i>Creative Commons License, NC-ND 2.0</i>
18	Tulane University Publications, <i>Creative Commons License, NC-SA 2.0</i>



EXHIBIT 31

 This site uses cookies for analytics, personalized content and ads. By continuing to browse this site, you agree to this use.

[Learn more](#)



Microsoft On the Issues

The Official Microsoft Blog

Deals

Support

The AI Blog

More

Transform



Related Stories

DREAMers make our country and communities stronger

Aug 31, 2017 | [Brad Smith - President](#)



We are deeply concerned by news reports about changes to the Deferred Action for Childhood Arrivals (DACA) that are under consideration. These changes would not only negatively impact thousands of hardworking people across the United States, but will be a step backwards for our entire nation.

Let me explain why.

The roughly 800,000 “DREAMers” who are registered beneficiaries of DACA were brought to this country as young children. Although undocumented, these young people grew up in the United States, attended our schools, built careers and started businesses, bought houses, started families and became part of our communities. The DACA program did not grant them a permanent immigration status — it only provided a temporary reprieve from deportation, requiring renewal every two years. But it provided work authorization, allowing them to integrate as contributing members into our nation’s workforce and society.

Ending DACA will drastically disrupt the lives of these

Sep 5, 2017 | [Brad Smith](#)

Urgent DACA legislation is both an economic imperative and humanitarian necessity >

Apr 24, 2018 | [Microsoft Corporate Blogs](#)

Statement from Microsoft President Brad Smith on DACA lawsuit ruling >

Nov 3, 2017 | [Microsoft Corporate Blogs](#)

New federal lawsuit seeks to preserve DACA >

individuals who willingly came forward to register with the federal government. They could lose their jobs and risk deportation. This repeal will also have significant economic consequences. Studies estimate that ending the program could cost the American economy [\\$460.3 billion in GDP](#) (gross domestic product) and [\\$24.6 billion in Social Security and Medicare tax contributions](#) over the course of a decade.

Jun 19, 2018 | [Brad Smith](#)

The country needs to get immigration right >

Our country will also lose the tremendous talent of these individuals. DACA recipients bring a wide array of educational and professional backgrounds that enable them to contribute in crucial ways to our nation's workforce. They are part of our nation's universities and work in every major industry. They are artists, advocates and health care providers. They help meet the needs of our communities and our companies.

We experience this in a very real way at Microsoft. Today we know of 27 employees who are beneficiaries of DACA. They are software engineers with top technical skills; finance professionals driving our business ambitions forward; and retail and sales associates connecting customers to our technologies. Each of them is actively participating in our collective mission to empower every person and every organization on the planet to achieve more. They are not only our colleagues, but our friends, our neighbors and valued members of the Microsoft community.

These employees, along with other DREAMers, should continue to have the opportunity to make meaningful contributions to our country's strength and prosperity. Instead of ending DACA, our policymakers and legislators should enact the DREAM Act or other permanent solution for DREAMers — a goal that continues to have bipartisan support.

Our country has always been a beacon of opportunity. If we are determined to preserve American leadership and excellence, let's build lasting solutions that extend dignity and opportunity while promoting our country's economic prosperity.

Tags: [Brad Smith](#), [Deferred Action for Childhood Arrivals](#), [employees](#), [Immigration](#)

Stay Connected

Have the latest posts sent right to your inbox. Enter your email below.

By providing your email address, you will receive email updates from the Microsoft on the Issues blog.

Email Address

SUBSCRIBE

What's new	Store & Support	Education	Enterprise	Developer	Company
NEW Surface Go	Account profile	Microsoft in education	Microsoft Azure	Microsoft Visual Studio	Careers
Surface Book 2			Enterprise	Windows Dev Center	About Microsoft
Surface Pro	Download Center	Office for students	Data platform		
Xbox One X	Sales & support	Office 365 for schools	Find a solution provider	Developer Network	Privacy at Microsoft
	Returns				
Xbox One S	Order tracking	Deals for students & parents	Microsoft partner resources	TechNet	Investors
VR & mixed reality	Store locations			Microsoft developer program	Diversity and inclusion
Windows 10 apps	Support	Microsoft Azure in education	Microsoft AppSource	Channel 9 Office Dev Center	Accessibility
Office apps	Buy online, pick up in store		Manufacturing & resources		Security
			Financial services		



English (United States)

[Contact us](#)[Privacy and cookies](#)[Terms of use](#)[Trademarks](#)[About our ads](#)

© Microsoft 2018

EXHIBIT 32



POLICY IBM IMMIGRATION

IBM CEO Ginni Rometty is in D.C. urging Congress to save DACA

IBM has 31 employees affected by Trump's decision to unwind the program.

By **Tony Romm** | [@TonyRomm](#) | Sep 19, 2017, 3:03pm EDT



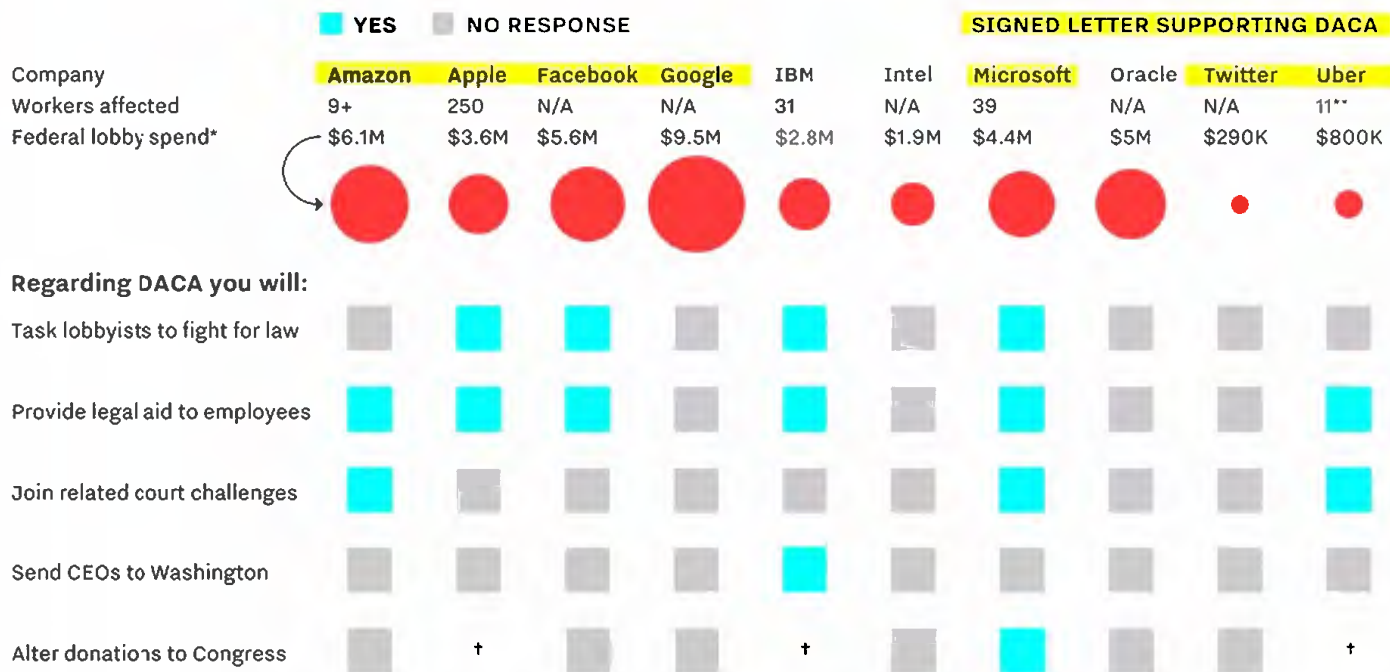
Olivier Douliery-Pool/Getty Images

Two weeks after President Donald Trump moved to eliminate a program that protects some young immigrants from deportation, IBM chief executive Ginni Rometty is visiting Capitol Hill to urge lawmakers to save it.

As part of a swing through Washington, D.C., this week, Rometty has met with Senate Democrats and Republicans in a bid to get them to preserve Deferred Action for Childhood Arrivals, or DACA, from phasing out beginning in March. The initiative, implemented in 2012, had allowed children brought to the United States illegally to obtain waivers so they could continue to live and work in the country.

"We've got 31 of these people at IBM," said Christopher Padilla, the vice president for government and regulatory affairs at IBM, in an interview Tuesday. "They're in a wide variety of jobs, everything from software development to people in our design lab who do regulatory compliance work."

How tech companies are responding to the DACA decision



*Jan.1-June 30 2017

** Doesn't include drivers

†Does not donate to Congress.

Source: the companies

recode

In Rometty's meetings — including a session with Senate Democratic Leader Chuck Schumer and an upcoming sit-down with GOP Sen. Jeff Flake — the IBM executive has even suggested that lawmakers address DACA as part of a bill they plan to consider in December to fund the government and raise the debt ceiling. That's a must-pass measure, and it could be an opening for lawmakers to tackle DACA after failing for years to reach a compromise on the program.

But Rometty did not say that Congress should reinstate DACA protections before moving on to tax reform — another major issue for IBM, and one that the company's leader raised during her meetings this week.

Others in the tech industry, including Microsoft President Brad Smith, have urged lawmakers to halt tax reform while they weigh the future of more than 800,000

beneficiaries of DACA, known as Dreamers.

Rometty also met with White House officials to discuss the issue this week.

RELATED

The Trump administration has announced the end of DACA – unless Congress can act to save it

The Trump administration has announced the end of DACA – unless Congress can act to save it

In a strong rebuke, Microsoft offered to aid employees affected by Trump's DACA decision

Apple, Microsoft, Uber and other tech giants are rising to the defense of Dreamers

Beyond IBM, the tech industry recently has ramped up its efforts to try to defend DACA and its beneficiaries, who work at companies like Apple, Microsoft and Uber. Some, like Amazon, have joined on court cases challenging Trump's decision to eliminate DACA; Facebook CEO Mark Zuckerberg, meanwhile, has sought to tell the stories of affected Dreamers through [FWD.us](#), his immigration reform-minded lobbying effort.

So far, though, IBM is the only tech giant whose chief executive has paid a visit to Congress. Rometty happened to be in town as a result of a meeting of the Business Roundtable, where she sits on the board of directors.

"The president has said there needs to be a legislative fix," Padilla said. "That's the best way to keep folks in the country before time runs out in March."



Recode Daily

Sign up for our Recode Daily newsletter to get the top tech and business news stories delivered to your inbox.

SUBSCRIBE

EXHIBIT 33

THINKPolicy Home About us Key issues Tags ▾

Dreamers

My American Dream, Minus the Paperwork

October 3, 2017

Categorized: [Dreamers](#)

Share this post:



The following post is the first in a THINKPolicy series profiling IBM Dreamers and their personal stories protected for confidentiality.

My story is the American Dream—work hard, make something of yourself, go to college, build a life here but one way—paperwork.

I was born in Mexico, and was brought here by my parents when I was 13. I quickly adjusted to life here as an American kid. I studied hard. I became the captain of my cross country team, and I was company commander. I always wanted to go to college—I'd be the first of my family to do so, and it represented the promise that I could make a better life for myself and my family.

I knew that because I didn't have legal status, that dream would be harder for me than most. I didn't know how to get it, but I kept working towards a degree in information systems management. While I was working multiple jobs, I got asked to interview for a job in a technology company. I showed up for the interview only to find out I wasn't qualified. I declined to go.

I got offered the job, and on the same day I received in the mail my legal work permit, which I was able to get through the Deferred Action for Childhood Arrivals program. I took it as a sign. I accepted the job and I started working in early 2013.

My life here is a privilege, and I've worked to live up to it every day. I've been an IBMer for almost two years on the Watson team. I've been able to use my degree to help build products and software to help Watson and its customers.

amounts of data. And I'm proud of the work I do at IBM to help develop new technologies that enable businesses and professionals to do their jobs better.

In the two years I have been at IBM, I've gotten to see — and contribute to — the development of Watson and amazing technology in the AI space. And I want to continue that work. It shouldn't be stopped because the DACA program ends.

My story is an example of the promise America brings to people from all backgrounds and all walks of life. DACA has given me an opportunity to be able to live in equality of circumstance. No more and no less. It wasn't my decision to come to the US, but for the past nearly twenty years, I have worked hard to uphold the American idea of identity.

I encourage Members of Congress to allow Dreamers like me to continue to embrace, and help improve, wellbeing by driving American innovation and economic growth. It is time to realize the real dimension of the tremendous strength that Dreamers have. I am hoping that lawmakers from all leanings can come together to stay permanently in this country we all call home.

Check back for more IBM Dreamer stories, which will be published regularly on THINKPolicy in the coming weeks.

“My story of the promise America brings to people from all backgrounds and all walks of life.”

DACA

Dreamers

immigration

[◀ Previous Post](#)

[The Challenges and Opportunities of a New Employment and Skills Landscape in Europe](#)

[IBM Letter of Support for Legislation](#)

Recent Posts

- [IBM Statement on Israeli Surrogacy Law](#)
- [IBM Applauds Senate HELP Committee Passage of Perkins Act Modernization Bill](#)
- [Data Stewardship and the Importance of Export Compliance in the IBM Cloud](#)
- [IBM's Response to EU Agreement on Legislation Regarding the Free Flow of Data](#)

EXHIBIT 34

Dreamers

I Felt Like a Normal American Kid...Then Everything Changed

October 9, 2017

Categorized: [Dreamers](#)

Share this post:



The following post is part of a THINKPolicy series profiling IBM Dreamers and their personal stories. This post is for confidentiality.

When I was growing up, my parents always pushed me to do well in school, to get involved and to give back. I studied; I volunteered; I was in the gifted student program from elementary school through high school. I had any normal American childhood.

When it came to college—it was always an expectation that I would make it there, rather than a far-off dream. We were proud that I would be a first generation college graduate. I focused on my studies. In my junior year, I was excited to enroll in dual-credit classes through the local community college. My parents and I went to fill out the paperwork and get our schedules.

Then everything changed.

As I was filling out my information, I realized I didn't have the paperwork that was required to enroll in college in this country when I was four years old—over ten years prior to the day I sat in that community college. I realized that because I didn't have the right documentation, all of the opportunities that I worked so hard for went home after learning I wasn't allowed to enroll—defeated and distraught. I wish I had been crying as a young child but learning I couldn't attend college hurt so much more... my entire future was at stake. My

I didn't want to talk to anyone about my situation; I was afraid. Just a few days prior, I felt like I had turned around, but now I felt lost and hopeless. But I couldn't give up. I found the courage to talk to a guidance counselor who helped me find a way to enroll in those classes by filling out additional paperwork. I took the classes and graduated in the top 10% of my class, and even had the honor of giving the commencement speech at graduation at several universities and got accepted into all of them. I was eager to enroll full-time in college but knew that I would miss the classmates I had grown up with nearly my whole life.

Without the ability to apply for legal status (because there was no avenue to do so for someone in my situation), I had to rely on FAFSA to qualify for student financial aid. My concerns as I pushed my way through college weren't always resolved on an exam—they were whether I could find a scholarship or the money to pay for the next semester. My biggest concern was "what will I do after I graduate?" since I couldn't work legally in the United States. Even without the help of my family except paperwork, these were the types of challenges my situation required me to overcome.

I was able to support myself through my freshman year, and then the Deferred Action for Childhood Arrivals (DACA) came into place. I applied as soon as I could, and my work permit arrived a few months later.

About a year ago, I started working at IBM for the Global Technology Services team. I work with clients on the foundational systems and services that the world relies on to help them better serve their own customers and my community.

DACA enabled me to finish school and become that first-generation college graduate I had strived to become. It enabled me to contribute to the economy, and build a life for myself and my present and future. I want to excel and grow in my position and be a part of the IBM community driving innovation and helping our customers.

I am encouraging Members of Congress across this country to come together and find a way for people to stay in the States permanently. My entire life I have felt American. I love this country and the ways I'm able to contribute to the economy.

Check back for more IBM Dreamer stories, which will be published regularly on THINKPolicy in the coming week's story [here](#).

DACA

Dreamers

immigration

[< Previous Post](#)

[IBM Letter of Support for Legislation to Fight Human Trafficking](#)

EXHIBIT 35

Kenny: One Dreamer, weathering two storms

By David Kenny | December 3, 2017

2

His apartment building lost power when Hurricane Harvey hit Houston. Rather than staying home, he made his way to his mother's house and set up shop there. Using the internet from his cell phone and his laptop computer, this IBM cloud support technician worked around the clock during one of the most devastating natural disasters in U.S. history.

Given the concerns about his immigration status, I decided not to use his name.

Nevertheless, he worked his normal morning shift ... then the afternoon shift ... then the evening shift to fill the gaps in coverage our company was facing because of the storm. It was because of his selflessness and hard work that IBM's cloud support could stay up and running and ensure our clients we'd be there as they began their own recovery efforts.

This IBMer is an example of the extraordinary people we have working at our company every single day. He is also a Dreamer.

I recently met this remarkable young man when he and other Dreamers - those who are authorized to work under the Deferred Action for Childhood Arrivals program - visited Washington to urge members of Congress to pass legislation that would enable DACA recipients to stay in the United States. He told me how he was brought to this country by his mother when he was only two years old. Living in America is the only life he has ever known, but his future in this country was always uncertain.

He told me about how he stayed out of trouble when he was growing up. How he paid his way through school by working construction jobs and received an associate's degree. How he taught himself computer and technical skills on his own. But even after he got his degree, he wasn't able to work because he didn't have legal immigration status.

When the DACA program was put in place, he was finally able to use his degree and self-taught skills to get a job at a technology company. He was finally able to have the certainty that he'd be able to work and stay in this country without fear of deportation. Within a couple of years of the DACA program being put in place, he started working at IBM in technical support for our cloud operations.

Before coming to Washington, D.C., last month, he had never left Houston. But that day, he shared his story with members of Congress and their staff, and provided them with a glimpse into the extraordinary people Dreamers are.

Dreamers like these represent the values that built this country: hard work, respect and dedication. They make our company better and they make our communities better.

IBM is urging Congress to pass legislation that will allow Dreamers to stay in the United States. These 800,000 young people had decisions made for them as children, but now they are asking Congress to pass a bill that allows them to continue working and living their lives in the only country most of them have ever known. We should let them.

Kenny is senior vice president, Watson and Cloud Platform, IBM.

EXHIBIT 36

Nos. 18-485, 18-488

IN THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

Case Nos. 16-CV-4756 (NGG) (JO) (E.D.N.Y.), 17-CV-5228 (NGG) (JO) (E.D.N.Y.)

MARTÍN JONATHAN BATALLA VIDAL; MAKE THE ROAD NEW YORK, on behalf of itself, its members, its clients, and all similarly situated individuals; ANTONIO ALARCON; ELIANA FERNANDEZ; CARLOS VARGAS; MARIANO MONDRAGON; CAROLINA FUNG FENG, on behalf of themselves and all other similarly situated individuals, STATE OF NEW YORK, STATE OF MASSACHUSETTS, STATE OF WASHINGTON, STATE OF CONNECTICUT, STATE OF DELAWARE, DISTRICT OF COLUMBIA, STATE OF HAWAII, STATE OF ILLINOIS, STATE OF IOWA, STATE OF NEW MEXICO, STATE OF NORTH CAROLINA, STATE OF OREGON, STATE OF PENNSYLVANIA, STATE OF RHODE ISLAND, STATE OF VERMONT, STATE OF VIRGINIA, STATE OF COLORADO;

Plaintiffs-Appellees,

(Caption continued on inside cover.)

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NEW YORK

JOINT APPENDIX VOLUME 5 OF 14

CHAD A. READLER
Acting Assistant Attorney General
RICHARD P. DONOGHUE
United States Attorney
HASHIM M. MOOPAN
Deputy Assistant Attorney General
MARK B. STERN
ABBY C. WRIGHT
THOMAS PULHAM
Appellate Staff, Civil Division
U.S. Department of Justice
950 Pennsylvania Avenue NW
Washington, DC 20530
(202) 514-2000

NATIONAL IMMIGRATION LAW CENTER
Box #108-62
3450 Wilshire Boulevard
Los Angeles, CA 90010
(213) 639-3900

ERIC T. SCHNEIDERMAN
Attorney General
State of New York
120 Broadway, 25th Floor
New York, NY 10271
(212) 416-8921

v.

DONALD J. TRUMP, President of the United States; UNITED STATES CITIZENSHIP AND IMMIGRATION SERVICES; UNITED STATES IMMIGRATION AND CUSTOMS ENFORCEMENT; UNITED STATES OF AMERICA; UNITED STATES DEPARTMENT OF HOMELAND SECURITY; KIRSTJEN M. NIELSEN, Secretary of Homeland Security; JEFFERSON B. SESSIONS III, Attorney General of the United States;

Defendants-Appellants.

TABLE OF CONTENTS

Exhibits Filed in Support of <i>Batalla Vidal</i> Plaintiffs' Motion for Preliminary Injunction (continued)	JA1069
Ex. T: Declaration of Marcelo Suárez-Orozco, Ph.D (continued)	JA1069
Ex. U: Declaration of Emily Nishi	JA1099
Ex. V: Declaration of Dr. John Stobo	JA1104
Ex. W: Department of Homeland Security, <i>Frequently Asked Questions: Rescission of Deferred Action for Childhood Arrivals (DACA)</i> (Sept. 5, 2017)	JA1112
Ex. X: U.S. Citizenship and Immigration Services, <i>Guidance on Rejected DACA Requests and Frequently Asked Questions</i> (Nov. 30, 2017)	JA1118
Ex. Y: The White House, Remarks of President Trump (Feb. 16, 2017)	JA1121
Ex. Z: Associated Press, <i>Transcript of AP Interview with Trump</i> (Apr. 23, 2017)	JA1159
Ex. AA: Declaration of Dr. Clarence Braddock	JA1188
Ex. BB: Declaration of Shawn Brick	JA1195
Ex. CC: Declaration of Dr. Robin Holmes-Sullivan	JA1204
Ex. DD: Declaration of Janet Napolitano	JA1215
Ex. EE: Declaration of Diana Tellefson	JA1223
Ex. FF: Declaration of Natalie Cardenas	JA1230
Ex. GG: Declaration of Kathryn Eidmann	JA1237
Ex. HH: Declaration of Kathryn Abrams	JA1234
Ex. II: Declaration of Pamela Beckwith	JA1252
Ex. JJ: Declaration of Bill Blazar	JA1266
Ex. KK: Declaration of Miriam Feldblum	JA1272
Ex. LL: Declaration of Norberto Duenas	JA1281
Ex. MM: Transcript of Deposition of Gene Hamilton (Oct. 20, 2017)	JA1299
Ex. NN: Transcript of Deposition of James D. Nealon (Oct. 13, 2017)	JA1305
Ex. OO: Memorandum from Doris Meissner, Commissioner, Immigration and Naturalization Service, <i>Re: Exercising Prosecutorial Discretion</i> (Nov. 17, 2000)	JA1310
Ex. PP: Sam Bernsen, General Counsel, Immigration and Naturalization Service, <i>Legal Opinion Regarding Service Exercise of Prosecutorial Discretion</i> (July 15, 1976)	JA1324
Ex. QQ: Tweet from @realDonaldTrump Twitter Account (Sept. 5, 2017)	JA1333
Ex. RR: U.S. Citizenship and Immigration Services, <i>Guidance on Rejected DACA Requests and Frequently Asked Questions</i> (Dec. 14, 2017)	JA1335
Ex. SS: Letter from Plaintiffs' Counsel Amy Taylor to Defendants' Counsel Stephen Pezzi (Dec. 4, 2017) (redacted)	JA1339
Ex. TT: Petition for Writ of Certiorari, <i>United States v. Texas</i> (Nov. 20, 2015)	JA1348

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 73 of 191 PageID #: 1955

Suárez-Orozco, Marcelo M.

Vita

The Perfect Storm: Immigration, Schools and the State. Keynote Address. Bertelsmann Foundation 11th Conference on School Developments in Germany, Gutersloh, Germany, November 11, 2008.

Mass Migration: The Human Face of Globalization. Keynote Address. Migration: The Syracuse University Symposium. Syracuse, New York, October 28, 2008.

Learning a New Land: Immigrant Youth and the Globalization of America. Keynote Address, The 25th Symposium Lecture Series, Center for Multicultural Education, University of Washington, Seattle, WA, October 24, 2008.

Covering Immigration: Journalists and Scholars. Introductory Address. The Neiman Foundation for Journalism at Harvard University and Immigration Studies at NYU conference on Immigration Today, Cambridge, MA, October 3, 2008.

Interdisciplinary Reflections on Comparative Migration. Keynote Address. The President's Lecture Series, Western Connecticut State University, Danbury, CT, September 17, 2008.

The New Immigration to the United States. Dinner Address. United States Conference of Catholic Bishops. Washington, DC, July 28, 2008.

Global Flow: How Migration is changing the World. Dinner Address. The Board of Directors of the Western Union Company. The Peninsula Hotel, New York City, July 24, 2008.

Immigrant Youth: The Research Agenda. Keynote Address. The Funders Meeting of The Annie E. Casey Foundation. Baltimore, MA, June 23, 2008.

The New Inter-American Migration System. Keynote Address, The Western Union Latin American Agents Meeting, Panama City, Panama, June 3, 2008.

Immigrant Youth in Interdisciplinary Perspectives: New Findings from the LISA Study of the Harvard Immigration Projects. Keynote Address. Fundació Jaume Bofill, Barcelona, Spain, May 12, 2008.

Education, Globalization, and Culture. Keynote Address. CIIMU, the City Barcelona, and the University of Barcelona Symposium on Educacion, globalizacion e interculturalidad, Barcelona, May 15, 2008.

Immigrant Children, Youth, and Families: New Findings from the LISA Study. Cornell University's National Children, Youth and Families at Risk (CYFAR) Conference, San Antonio, Texas, May 8, 2008.

Psycho-Social Reflections on Immigration Today. Keynote Address. Immigration and HIV/AIDS. New York. St. Vincent's Hospital and NYU Hospital, The Kimmel Center, New York University, May, 2, 2008.

Immigration and American Democracy. The Lawrenceville School Senior's Capstone Lecture. Princeton, NY, April 15, 2008.

Immigration and Globalization. Class of '48 Lecture, the Burgin Center's Simon Theatre, Mercersburg Academy, Mercersburg, PA, April 14, 2008.

Suárez-Orozco, Marcelo M.

Vita

Why Migrate? Keynote Address. The First Year Experience, SUNY Old Westbury, NY, April 7, 2008.

Immigration and the Law: Comparative Reflections. Invited Address, New York University School of Law, NY, April 4, 2008.

Immigration and Latin America Today. Keynote Address. The Honors College, Kent State University, Kent, Ohio, April 1, 2008.

Dual Language: A Passport to Global Citizenship. Keynote Address. New York City Department of Education Dual Language Symposium, New York University, NY, March 27, 2008.

Education for Citizenship in the Global Era (with Carola Suarez-Orozco, Howard Gardner and The Hon. Graziano Del Rio. Mayor of Reggio Emilia). Centro Internazionale Loris Malaguzzi, Reggio Emilia, Italy, March 18, 2008.

Learning a New Land: Immigrant Students in American Society. Keynote Address. International Education Student Conference, New York University, NY, March 13, 2008.

Global Moves: How Migration is changing the World. Keynote Address. Western Union Kickoff Conference, Fort Lauderdale, FL, February 12, 2008.

Waves of Migration: Implications for Stakeholders in Business and Society. Keynote Address. Joint Meeting of the Contributions Council I and II, Arizona State University, Tempe, AZ, February 5, 2008.

Immigration, Education and Integration: The View from the United States. Invited address. The Bertelsmann Foundation Conference of Global Immigration, Education, and Integration, Berlin January 24, 2008.

Writing Immigration. Keynote Address. The Neiman Foundation for the Study of Journalism, Harvard University. Cambridge, MA, December 12, 2007.

Rethinking Immigration and Education. Keynote Address. Annual Meeting of the Texas Educational Agency Leadership Council, Dallas, TX, November 7, 2007.

Immigration and Education Today. Keynote Address. Grand Rapids Community College, Grand Rapids MI, October 24, 2007.

Integration and Education in the 21st Century. Invited Address at the German Foreign Office, Berlin, October 17, 2007.

Education for Globalization. Keynote Address. Pittsburgh Area Independent School Teachers' Association Annual Conference, Pittsburgh, PA, October 8, 2007.

Immigrants in the US Education System and Abroad. Keynote Address. Jobs for the Future Double the Numbers National Conference, Washington, DC, October 4, 2007.

Suárez-Orozco, Marcelo M.

Vita

What is Globalization? Keynote Address to the Faculty. The Ross School, East Hampton, New York. August, 20, 2007.

Migration Today; Reflections on the Mexican Experience in Longitudinal Perspective. (Carola Suárez-Orozco and Marcelo Suárez-Orozco). Keynote Address. Universidad Popular Autonoma del Estado de Puebla, Mexico, August 9, 2007.

Migration and Culture: A Dialogue for Integration. Roundtable with the Hon. Felipe González. Former Prime Minister of Spain, the Hon. Dominique de Villepin, Former Prime Minister of France, Joseph Stiglitz and others. The Atman Foundation, Madrid, Spain, June 15, 2007.

The Schooling Pathways of Immigrant Youth. Keynote Address. Jaume Bofill Foundation and Universitat Oberta de Catalunya, Barcelona, Spain, May 22, 2007.

The Access of Immigrants and Their Families to a Decent Standard of Living. Keynote Address. The Pontifical Academy of Social Sciences XVIII Plenary Session on Charity and Justice in the Relations Between Nations. Vatican City, May, 1, 2007.

The Education of Immigrant Students: 25 Years After Plyer v Doe. Invited Presidential Panel. AERA Annual Meeting, Chicago, Ill. April 10, 2007.

Good Work in the Global Era. Invited Fireside Chat – with Howard Gardner. AERA Annual Meeting, Chicago, Ill. April 9, 2007.

Global Moves: How immigration is transforming the U.S. Keynote Address. Department of Educational Leadership and Policy Studies, Southern Connecticut State University, New Haven, April 2, 2007.

Immigration and American Citizenship. The Weil Lecture on American Citizenship. University of North Carolina at Chapel Hill, March 28, 2007.

Rethinking Latin American Immigration to the United States. Keynote Address. The Institute for the Study of the Americas, University College, London, March 14, 2007.

Immigration and the Family. Invited lecture. Annual Meeting of the National Center for Family Literacy. Orlando, FL, March 3, 2007.

Immigration and Education: The Texas Experience in Global Context. Keynote Address. Annual Meeting of the Texas Educational Agency Leadership Council, Austin, TX, January 10, 2007.

Race and Immigration: Challenges and Opportunities for the New American Majority. Moderator. El Museo del Barrio, New York, December 9, 2006.

Reflections on Global Migration: The US Case. Invited lecture. The Africa House Conference of International Migration, New York University, NY, December 5, 2006.

Migration and Education in the Global Era. Keynote Address. Annual Meeting of the Association for the Study of Higher Education, Anaheim, CA, November 3, 2006.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 76 of 191 PageID #: 1958

Suárez-Orozco, Marcelo M.

Vita

Immigration Reform. Keynote Address. New York University School of Law Conference on Immigration and the Law, New York, October 27, 2006.

Moving Stories: The Academic Pathways of Immigrant Youth (with Carola Suárez-Orozco). Keynote Address. The Askwith Forum at Harvard University, Graduate School of Education, Cambridge, MA, October 23, 2006.

Migration in the Americas. Keynote Address to School Assembly. Phillips Academy, Andover, MA, October 11, 2006.

Covering Immigration: What Every Journalist Needs to Know but is Afraid to Ask. Keynote Address. Neiman Foundation for Journalism at Harvard University, Cambridge, MASS, September 27, 2006.

Who is An American? The Immigration Debate After 9/11. Keynote Address. The Gerald R. Ford Presidential Museum and the Hauenstein Center for Presidential Studies, Grand Rapids, Michigan, September 19, 2006.

The New Immigration: Conceptual and Empirical Considerations. Keynote Address. Columbia Basin College Faculty Development Conference, Pasco, Washington, September 14, 2006.

Immigration Today: US Dilemmas and Options. Keynote Address. Kennesaw State University's Conference on Georgia's Undocumented Workforce, Kennesaw, Georgia September 8, 2006.

Education and the Challenges of Globalization. Keynote Address. Manhattan's Region 9 Principals and Senior Leadership Annual Conference. Stuyvesant High School New York, August 30, 2006.

Globalization and Education. Keynote Address. American Educational Research Association and Teachers College, Columbia University, New York, August 19, 2006.

Educating Students for the 21st Century. Keynote Address. National Conference of State Legislators. Nashville, TN, August 18, 2006.

Immigrants and the Achievement Gap (with Carola Suárez-Orozco). Invited presentation. The Achievement Gap Initiative at Harvard University. Kennedy School of Government, Cambridge, Massachusetts, June 19m 2006.

Rethinking Global Migration: New Realities, New Opportunities, New Challenges with the Hon. Mary Robinson, Former President of Ireland and Former UN High Commissioner for Human Rights and the Hon. Luis Ernesto Derbez, Foreign Minister of Mexico. New York University, New York, May 25, 2006.

Immigrant Students in the 21st Century. Keynote Address, The Massachusetts Elementary School Principals Association Annual Meeting, Cape Cod, Massachusetts, May 4, 2006.

Latin American Emigration Today: Data, Concepts, and Reflections. Keynote Address. International Migration: The Human Consequences of Globalization. Second Colloquium of the Ministry of Foreign Affairs and the Pontifical Academy of Social Sciences, Mexico City, Mexico, March 27, 2006.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 77 of 191 PageID #: 1959

Suárez-Orozco, Marcelo M.

Vita

Global Migration Today: The Best of Times, The Worst of Times. Speakers on the Square Lecture. New York University, New York, March 23, 2006.

The Second Generation. Invited Lecture Delivered to the NYU School of Law, New York, March 21, 2006.

Immigration Policy Today: US Perspectives. Keynote Address Delivered to Visiting Dignitaries of the United States Department of State, New York City, March 16, 2006.

Globalization and Education. Keynote Address. Annual Meeting of the National Association of Independent Schools. Fleet Center, Boston MA, March 1, 2006.

The Latino Second Generation: What is New? What is Different? Keynote Address. The Young Latino Second Generation Conference. Telemundo/NBC, Nokia Theatre, New York City, February 28, 2006.

Globalization, Immigration and Education. Keynote Address. The Penn Ethnography Forum. University of Pennsylvania, PA, February 24, 2006.

Immigration and Education Today. Presentation to the Dean's Council, Steinhardt School of Education, New York University, New York, January 23, 2006.

Globalization and Education. Keynote Address. Join Workshop of the Pontifical Academy of Sciences and the Pontifical Academy of Social Sciences. Vatican City, November 17, 2005.

Educating the Global City, IGEMS Inaugural. The Great Hall, Cooper Union. New York City, November 1, 2005.

Rethinking the New Immigration. Invited Address. Centrum voor Sociale en Culturele Antropologie, Katholieke Universiteit te Leuven, Belgium, October 26, 2005.

Globalization, Immigration and Education: Some empirical findings and conceptual problems in an emerging field. Keynote Address. The Leuven Seminar on Globalization. Catholic University of Leuven, Belgium. October 25, 2005.

Globalization, Culture and Education. Keynote Address. The Antwerpen Seminar. Antwerp University, Belgium, October 24, 2005.

Doing Research on Diversity: The Fellows Forum. The National Academy of Education. Teachers College, Columbia University, New York, October 21, 2005.

Building the Harvard Immigration Projects. Invited Address, the National Academy of Education. Teachers College, Columbia University, New York, October 20, 2005.

Moving Stories: The Lives and Dreams of Immigrant Youth. Keynote Address. The Lynch School of Education. Boston College. Boston, MA, October 5, 2005.

Immigration Today: What Every Journalist Needs to Know. Keynote Address. The University of Maryland Journalism Fellows. September 28, 2005.

Suárez-Orozco, Marcelo M.

Vita

Globalization and Education in the Heartland. Keynote Address. The Omaha Public Schools. Omaha, Nebraska. September 27, 2005.

Exodo: Latin American Emigration and its Consequences. Keynote Address O BRASIL NO FLUXO DAS MIGRAÇÕES INTERNACIONAIS: SIMPÓSIO INTERNACIONAL, Universidade Pontifícia Católica de São Paulo. Brazil, September 17, 2005.

Immigrant Cultural Psychologies. Keynote Address. Department of Social Psychology, University of Sao Paulo. Brazil, September 16, 2005.

Beyond Tolerance: Globalization and Education in Troubled Times. Keynote Address. Facing History and Ourselves First Global Symposium. Boston, MA, August 11, 2005.

Education for All? The 25th Anniversary Tällberg Forum, Her Majesty Queen Silvia in attendance. Tällberg, Sweden, August 3, 2005.

Rethinking Latino Studies. Keynote Address. 2nd Annual Harvard Latino Studies Research Symposium. Harvard University, Cambridge, MA, May 13, 2005.

Everything you ever wanted to know about Cultural Psychology but were afraid to ask. The Monroe Stein Colloquium Lecture. New York University, Steinhardt School of Education. New York, April 28, 2005.

Globalization and Education: Reflections on John U. Ogbu's Contributions to a Future Field. The John U. Ogbu Memorial Lecture. Department of Anthropology. University of California, Berkeley, April 18, 2005.

Rethinking Immigration and Education in the Era of Accountability. Presidential Invited Session. American Educational Research Association. Montreal, Canada, April 15, 2005.

Education, Immigration, and Globalization: Diversity, Complexity and the Democratic Promise. Presidential Invited Session. American Educational Research Association. Montreal, Canada, April 12, 2005.

Interdisciplinary Reflections on the New Immigration. Invited Address. Department of Psychology. New School University. New York, April 7, 2005.

Global Understanding: Learning and Education in Troubled Times. Keynote Address. The First International Conference on Globalization and Learning. Stockholm, Sweden, March 18, 2005.

Moving Stories: Rethinking Immigration and Education in the Global Era. Keynote Address. Annual Meeting of the Sociology of Education Association. Asilomar, CA. February 19, 2005.

Psychosocial Perspectives on the New Immigration. Invited Address. Department of Community Psychology, New York University. February 14, 2005.

Immigration Today. Keynote Address. Emerson College Department of Performance Art Workshop on Immigration Today. January 27, 2005.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 79 of 191 PageID #: 1961

Suárez-Orozco, Marcelo M.

Vita

Globalization, Immigration and Education. A conversation between President John Sexton and Marcelo M. Suárez-Orozco. The Steinhardt School of Education and the Ross Institute. January 25, 2005.

Global Migration. Paper presented to the UN Secretary-General's First Annual Global Colloquium of University Presidents. Columbia University. January 19, 2005.

Anthropological Reflections on the Sense of History. Invited Address. The Sense of History: Uses and Abuses of the Past. Club of 3. Schlosshotel Cecilienhof Am Neuen Garten, Potsdam, Germany. December 4, 2004.

Conceptual and Empirical Aspects of the New Immigration. Keynote Address Baruch College Workshop on Trends in Mexican Immigration to the United States. September 24, 2004.

Interdisciplinary Research in the Social Sciences. Keynote Address. Harvard University/LASPAU Conference on New Developments in the Social Sciences. Lamont Library, Harvard College. July 16, 2004.

Latino Paradoxes. Keynote Address (read in absentia). The Latino Health Paradox Conference. Harvard School of Public Health. June 24, 2004.

Beyond Tolerance. Co-convenor and Presenter. The Ross Institute and the Survivors of the Shoah Visual History Foundation Workshop on Tolerance and Education. June 16, 2004.

Education and Globalization. Keynote Address. Globalization and Social Justice Conference. The Vatican's Pontifical Academy of Social Sciences and the Secretary of State, Mexico. June 4, 2004.

Immigration and Globalization: Interdisciplinary Perspectives. Keynote Address. Immigration Today Conference. Centrum voor Sociale en Culturele Antropologie, Katholieke Universiteit te Leuven (Belgium), June 1, 2004.

Reflections on Education and Globalization. American Academy of Arts and Sciences, Cambridge, MA. May 13, 2004.

Immigration: Three Paradoxes, Two Disciplines, One Claim. Invited Address. Department of Humanities and Social Sciences. Steinhardt School of Education. New York University, NY. March 23, 2004.

Thinking Inter-Disciplines. Invited Address. The Harvard Interdisciplinary Project. Project Zero, Harvard University, Cambridge, MA. March 18, 2004.

Immigration and Well-Being. Keynote Address. Loma Linda University, Loma Linda, California. March 11, 2004.

Immigration in the Study of Race, Culture and Power in the Educational Process. Invited Address. Teaching Race: Race, Culture and Power in the Educational Process. University of New Hampshire, NH. October 31, 2003.

Thinking Through Latino Immigration. Keynote Address. Morton College Faculty Day, Cicero, Ill. August 21, 2003.

Suárez-Orozco, Marcelo M.

Vita

Promoting Social Cohesion through Education. Invited Address. The Organization for Economic Co-operation and Development (OECD). Paris. July 3, 2003.

Immigration, Globalization, and Education. (Lectures in Berlin, Hamburg, Düsseldorf, Wiesbaden, and Munich). (Carola Suárez-Orozco and Marcelo M. Suárez-Orozco). Invited Lecture Tour Organized by the US Embassy, Germany. June 23-June 27, 2003.

Immigration and Education: Preliminary Findings from the Harvard Immigration Projects (Two Lectures). (Carola Suárez-Orozco and Marcelo M. Suárez-Orozco). Invited Lectures delivered to the City of Stockholm, Sweden. June 17 and 18, 2003.

Latinos: Remaking America. Invited Keynote Address. Dealing with Difference Summer Institute. Western Illinois University. Macomb, Ill. May 18, 2003.

Current Issues in Migration Policy. Invited presentation with the Hon. Dr. Rita Sussmuth, Former Speaker of the German Bundestag. The Goethe-Institut Inter Nationes. Boston, May 7, 2003.

Immigrants Mean Business. Invited Lecture. Harvard Business School. May 1, 2003.

Globalization and Child Development: The Research Agenda. Invited Address. The 2003 SRCD Biennial Meeting. Tampa, FL. April 26, 2003.

Global Moves: Migration, Education, Utopia, and Distopia. Keynote Address. Educational Democracy, Citizenship, and the New Immigration Conference. University of Illinois. Champaign Urbana, April 12, 2003.

Education, Culture and Immigration. Invited Address. The Weyland Public Schools, Weyland, MA, April 11, 2003.

The Handley Lecture on Human Values. Invited Address. The Pingry School, Martinsville, New Jersey. April 4, 2003.

Immigration and Education. (Three Lectures). (Marcelo Suárez-Orozco and Carola Suárez-Orozco). Invited lectures delivered to the East Hampton School District and the Ross Institute of New York. East Hampton, NY. March 21 and 22, 2003.

The Impact of HR 1 on Immigrant and English Language Learners. (Carola Suárez-Orozco and Marcelo M. Suárez-Orozco). Invited Address. The Aspen Institute Congressional Program. Montego Bay, Jamaica. February 18, 2003.

Latinos in the US: Academic Perspectives. Invited Address. The US-Spain Council. Madrid, February 6, 2003.

New Developments in Latin American Immigration to the United States. Invited Address. David Rockefeller Center for Latin American Studies Regional Office. Santiago de Chile. January 8, 2003.

Latinos in Cities. Invited Address. Invited Address. The Newark Public Library, Newark, NJ, October 3, 2002.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 81 of 191 PageID #: 1963

Suárez-Orozco, Marcelo M.

Vita

Remaking the Geography of California Identities. Invited Address. The Geography of California Identities Conference. Stanford University, April 26, 2002.

Latinos Mean Business. Invited Address. The David Rockefeller Center for Latin American Studies Corporate Partners Program. Harvard University, April 19, 2002.

Global Engagement: Immigrant Youth and the Process of Schooling (Carola Suárez-Orozco and Marcelo M. Suárez-Orozco). Fifth Roberta Grodberg Prize Lecture, 9th Biennial Meeting of the Society for Research on Adolescence. New Orleans, April 12, 2002.

A Kinder, Gentler Cultural Psychology for the New Millennium. Keynote Address. Boston Area Cultural Psychology Study Group. April 9, 2002.

Latinos: Remaking the Americans. Inaugural Address. David Rockefeller Center for Latin American Studies Symposium on "The Other Latinos." Harvard University, April 5, 2002.

Education, Culture, and Globalization. World Economic Forum Dinner Hosted by Mrs. Courtney Ross Holst Commentary with Her Highness Shiekha Mousa bint Nasser Al-Misnad, Emira of Qatar and the Honorable Hillary Rodham Clinton, and Howard Gardner. New York City, NY, February 1st, 2002.

Children and Violence: Psychocultural Perspectives. Invited Address. Harvard Children's Initiative. Harvard Faculty Club, Cambridge, MA, December 4, 2001.

Thinking through the Immigrant Paradox. Faculty Seminar. Department of Social Medicine, Harvard Medical School. Boston, MA, December 3, 2001.

Immigration and Education Reform. The Principal's Center Forum on Educational Reform. Harvard University Graduate School of Education. Cambridge, MA, November 9, 2001.

Law and Immigration After September 11. Law and Immigration Conference, Harvard Law School. Cambridge, MA, November 8, 2001.

Caribbeans on the Move: Comments on Recent Developments in the Study of Haitian Immigration. Conference on Haitian Immigration to the United States. David Rockefeller Center for Latin American Studies, Harvard University. Cambridge, MA, October 26, 2001.

Globalization: The Research Agenda. Keynote address delivered to Board of Directors, Cambridge College. The Rockefeller Bothers Conference Center at Pocantico, Tarrytown, New York. October 17th, 2001.

The New Anthropology of Immigration: Comparative Reflections of Recent Developments in Latin American, Caribbean, and Asian Immigration. Advanced Seminar. School for American Studies, Santa Fe, New Mexico. October 10, 2001.

Rethinking Culture: Immigration, Assimilation, and Acculturation in the Global Era. Keynote Address. The Federal Reserve Bank of Boston 46th Economic Conference on Seismic Shifts: The Economic Impact of Demographic Change. Chatham, MA. June 12, 2001.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 82 of 191 PageID #: 1964

Suárez-Orozco, Marcelo M.

Vita

The New Immigration: Some Interdisciplinary Reflections. Invited Address. The Harvard Club of New York City, May 24, 2001.

Psychosocial Perspectives on the Children of Immigration. Invited paper read to the Judge Baker Children's Center, Harvard Medical School. May 16, 2001.

Thinking Through the New Census. Invited Address. The Advisory Committee Meeting of the David Rockefeller Center for Latin American Studies, Harvard University. Cambridge, MA, May 12, 2001.

Rethinking Mexican Immigration to the US. Invited paper read to the conference on the Changing Agenda of the U.S.-Mexico Relationship. David Rockefeller Center for Latin American Studies, Harvard University. Cambridge, MA, April 23, 2001.

Immigrant Children: What We Know and Know We Know It. Invited paper read to the Annual Meeting of the American Educational Research Association. Seattle, Washington, April 11, 2001.

Reflections on Immigration and (Homo)Sexuality. Invited Address. Passing Lines: Immigration and (Homo)Sexuality Conference. David Rockefeller Center for Latin American Studies, Harvard University. Cambridge, MA, April 5, 2001.

The Longitudinal Study of Immigrant Lives: An Introduction to the Longitudinal Immigrant Student Adaptation Study. Invited Address. The Murray Research Center for the Study of Lives. Radcliffe Institutes for Advanced Study, Cambridge, MA, March 20, 2001.

Global Acts: Immigrant Children, Education, and the Post-National. Invited paper read to the Visiting Committee, Harvard Graduate School of Education, Cambridge, MA, March 14, 2001.

Thinking Through Globalization. Invited Address. Joint meeting of the Centers for Asian American Studies, Latin American Studies, and Latino Studies, University of Massachusetts, Amherst, MA, February 15, 2001.

Recent Theoretical Currents in the Study of Immigration. Invited paper read to the Immigration and Religion Interfaculty Initiative, Harvard University, Cambridge, MA, December 13, 2000.

Rethinking the Urban. Invited paper read to the Dean's Weekend, Graduate School of Education, Harvard University, Cambridge, MA, December 2, 2000.

Educational Challenges for Haitian Immigrant Youth: Perspectives from the Harvard Immigration Projects. Invited Address. The Haitian Studies Association Meeting Twelfth Annual Conference. West Palm Beach, Florida, October 25th, 2000.

Childhood Depression Among Immigrants. Invited paper read to the Childhood Depression Research Center. Judge Baker Children's Center, Harvard Medical School. October 18, 2000.

Freedom and Responsibility in the Global Era of Migrations and Transnationalism. Keynote Address. Freedom and Responsibility: A National Conference of the Association Montessori Internationale. Boston, MA. July 23, 2000.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 83 of 191 PageID #: 1965

Suárez-Orozco, Marcelo M.

Vita

Immigration Today. Invited Address. The International Press Institute. Boston, MA, May 2, 2000.

Immigration and the Blurring of Boundaries. Paper read to the invited session on 'Blurred Boundaries: The Cultural Politics of Racial Identity in the New Millennium.' American Educational Research Association. New Orleans, LA, April 25, 2000.

Immigrant Students in the Cusp of the New Millennium. American Educational Research Association. New Orleans, LA, April 24, 2000.

Latinos in the United States: The Research Agenda. Invited Address. The Center for US Studies, Universidad de la Habana, Cuba. April 19, 2000.

Keynote Address. The Second Institute on Cultural and Linguistic Diversity. Brown University, Providence, RI, April 10, 2000.

Latinos in the 21st Century: Introduction. Latinos in the 21st Century: Mapping the Research Agenda, David Rockefeller Center for Latin American Studies, Harvard University. Cambridge, MA, April 6, 2000.

Latinos in the United States: The Research Agenda. Invited Address. People en Español, Time-Warner. New York City, NY, March 3, 2000.

Keynote Address. Spencer Foundation Conference on the Role of Educational Ethnography in Pedagogy. University of Huston, TX, February 11, 2000.

Assimilation: Distopia, Utopia, and In-Between. Invited paper read to the Social Science Research Council Workshop on Ethnic Customs, Assimilation, and American Law. Phoenix, AZ, January 14, 2000.

Assimilation: Who Needs It? Invited paper read to the Russell Sage Foundation. New York City, January 5, 2000.

Rethinking Identity. Invited paper read to the Harvard Haitian Alliance Conference on The Haitian Identity Crisis: Cultural Pride and Preservation or Denial and Assimilation. Lowell House, Harvard University. December 16, 1999.

Identities and Styles of Adaptation: Theoretical Reflections on the First Wave of Data from the Harvard Immigration Project. Invited paper read to the Annual Meeting of the American Anthropological Association. Chicago, IL, November 21, 1999.

Reflections on Hate Crimes. Invited Paper read to the Harvard Foundation Panel on Hate Crimes in America: The Search for Solutions. Sanders Theater, Harvard University. November 10, 1999.

EU-USA Border Controls: Some Comparative Considerations. Invited Paper read to the Workshop on Border Control, State Power and Economic Integration: Perspectives from Europe and North America. Weatherhead Center for International Affairs, Harvard University. June 5, 1999.

Suárez-Orozco, Marcelo M.

Vita

The New Bostonians: Immigration and the Sociocultural Remaking of an American Metropolis. The Lowell Lecture. The Bostonian Society, Old State House, Boston. May 4, 1999.

Some Theoretical Considerations in the Study of Immigration. Invited Paper read to the Weatherhead Center for International Affairs, Harvard University. April 29, 1999.

Immigrant Children: What Do We Know? What Do Schools Need to Do? Keynote Address. All Means All Conference. The School District of Philadelphia. March 13, 1999.

The Children of Immigrants: Everything You Ever Wanted to Know About Assimilation but Were Afraid to Ask. Invited Paper read to the Chicano/Latino Policy Project. Institute for the Study of Social Change, University of California, Berkeley. March 5, 1999.

Getting It Right About Immigrant Children's Development: Some Interdisciplinary Reflections. Invited Paper read to Conference on Getting It Right about Children's Development: The Influences of Nurture and Nature. Harvard Children's Initiative and the American Academy of Arts and Sciences. February 5, 1999.

Writing Immigration: Interdisciplinary Observations. Invited paper read to the Conference on Writing Immigration: Academic and Journalistic Perspectives. David Rockefeller Center for Latin American Studies, Harvard University. December 10, 1998.

Immigration and Population in Psychocultural Perspectives. Invited paper read to the Annual Meeting of the American Anthropological Association. Philadelphia, PA, December 4, 1998.

Interdisciplinary Approaches to the Study of Immigration. Invited paper read to the Annual Meeting of the American Anthropological Association. Philadelphia, PA, December 4, 1998.

Immigration and the 'Free Exercise of Culture.' Invited paper read to the Social Science Research Council Workshop on the Free Exercise of Culture. Stanford, CA, November 6, 1998.

Psychocultural Approaches to Immigration Research. Invited paper read to the program in Medical Anthropology, Department of Anthropology, Harvard University. October 30, 1998.

Latin American Immigration to the United States. Invited paper read to the Conference on the United States, Latin America, and Europe: Analysis of the New Agenda. First Annual Hewlett Conference on Latin America, University of London and the David Rockefeller Center for Latin American Studies, Harvard University. October 17, 1998.

Immigration Today: Theoretical Problems in the Study of Children. Keynote address, Urban Superintendents Program Advisory Committee, Harvard University Graduate School of Education. October 8, 1998.

Anthropological Perspectives in the Study of Immigrant Children. Invited paper read to the Workshop on Immigrant Children. Bendheim Thoman Center for Research on Child Wellbeing, Office of Population Research, Princeton University. May 8, 1998.

Culture and the Education of Immigrant Children. Invited paper read to the American Educational Research Association, San Diego, California. April 17, 1998.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 85 of 191 PageID #: 1967

Suárez-Orozco, Marcelo M.

Vita

Everything You Ever Wanted To Know About Transnationalism but Were Afraid to Ask. Invited paper read to the Conference on Transnationalism and the Second Generation, Harvard University. April 4, 1998.

The Cultural Psychology of Immigration: Implication for Psychiatry. Invited paper read to the Department of Psychiatry Harvard University. April 6, 1998.

Latin American Immigration to the United States: Some Interdisciplinary Observations. Invited paper read to the Institute of Latin American Studies, University of London. March 6, 1998.

The Anthropological Study of Immigration: Reflections on a Decade of Research. Invited paper read to the Institute of Latin American Studies, University of London. March 11, 1998.

Rethinking the Study of Identity: Some Interdisciplinary Reflections. Invited paper read to the Children's Studies Conference on Youth, Identity, and Achievement, Harvard University, February 27, 1998.

Crossings: Some Interdisciplinary Reflections on the New Immigration. Invited paper read to the Joint Seminar of the Administrative Fellows, Harvard University, January 21, 1998.

Three Anthropological Themes in the Study of Immigration. Invited paper read to the Instituto Nacional de Antropología, Buenos Aires, Argentina. December 22, 1997.

North-South Relations: The Issue of Latin American Immigration to the United States. Invited paper read to the Harvard Club of Argentina, Buenos Aires, Argentina. December 18, 1997.

The Cultural Psychology of the Second Generation. Invited paper read to the Second Generation Symposium. The Jerome Levy Economics Institute of Bard College, New York. October 24, 1997.

Some Thoughts on the New Immigration: Implications for Issues of Education Research. Keynote speech read to the conference on Immigration and Education: Issues and Research. Spencer Foundation/UCLA. August 8, 1997.

Social Violence in Interdisciplinary Perspective. Invited paper read (in absentia) to Biannual Meeting of the Society for Psychological Anthropology, San Diego, CA. August 7, 1997.

The Impossible Professions: Rethinking Psychoanalysis and Social Theory. Invited paper read to the conference on Mothering: Diverse Families, Diverse Theories. Women's Studies Program, Brandeis University, April 13, 1997.

Psychodynamic and Cultural Factors in Immigrant Adaptation. Invited paper read to the conference on Immigration and the Sociocultural Remaking of the North American Space. David Rockefeller Center for Latin American Studies, Harvard University, April 12, 1997.

Immigration: The Next Fifty Years. Invited keynote speech read at the opening of the first Immigration Center of the Children's Aid Society, New York, New York. March 13, 1997.

Immigration and the 'New' New Yorkers. Invited paper read to the Harvard Club of New York, March 13, 1997.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 86 of 191 PageID #: 1968

Suárez-Orozco, Marcelo M.

Vita

Everything You Ever Wanted to Know About Immigration but Were Afraid to Ask. Invited paper read to the Monthly Latin American Faculty Luncheon, David Rockefeller Center for Latin American Studies, Harvard University. March 6, 1996.

Immigration Today: The Grammar of a Transnational Malaise. Invited paper read to the NPI, Department of Psychiatry, University of California, Los Angeles, January 23, 1997.

What do Immigrants Want? What does Los Angeles Want? Invited paper read to the Harvard Club of Los Angeles, January 23, 1997.

State Terrors: Immigration in Comparative Perspective. Paper presented to the Annual Meeting of the American Anthropological Association. San Francisco, CA, November 20, 1996.

Immigration and the Socio-Cultural Remaking of the North American Space: Implications Schooling in the 21st Century. Invited paper read to the Initiatives for Children, American Academy of Arts and Sciences, Cambridge, November 16, 1996.

The New Immigration: Implications for Schooling and Society. Invited paper read to the 24th Annual Conference of the Texas Association for Bilingual Education, Fort Worth, Texas, November 15, 1996.

Comparative Perspectives on the 'New Immigration.' Invited paper read to the Asian American Studies Center, University of Houston, Texas, November 14, 1996.

Psychological Anthropology Today. Invited paper read to 'The Power of Ideas' Speaker Series, Wheelock College, Boston, November 13, 1996.

Immigration and Socio-Cultural Remaking of American Democracy: Perspectives from Cultural Psychology. Invited paper read to the Program in Human Development Colloquium Series, Department of Psychology, Boston University, October 30, 1996.

Is the New Immigration Good for America? Is the New America Good for Immigrant Children? Research on the Schooling and Mental Health of Immigrant Children. Invited paper read to the Judge Baker Center, Children's Hospital, Harvard Medical School, October 23, 1996.

Immigrants and Refugees in the Space of Post Nationality. Invited paper read to the international conference on Civilization and Its Enduring Discontents: Violence and Aggression in Psychoanalytic and Anthropological Perspective. Bellagio Study and Conference Center, Como, Italy. September 2-6, 1996.

Cultures Under Siege/Migrants Under Siege. Invited paper read to the international conference on Cultures Under Siege: Psychological Anthropology on Violence and Aggression in the Late Twentieth Century in Celebration of the 360th Anniversary of Utrecht University. Utrecht, The Netherlands. August 29-30, 1996.

New Psychologies, Old Psychologies, Cultural Psychologies. Invited paper read to the international conference on New Psychologies. Stonefield Castle, Tarbert, Loch Fyne, Scotland. June 28-July 1, 1996.

Suárez-Orozco, Marcelo M.

Vita

Immigration and the Collective Anxieties at the End of the Century. The Norbert Elias Lecture. Amsterdam School for Social Science Research, The Netherlands. May 28, 1996.

The Cultural Psychology of Growing Up Latino in America. Invited paper read to the session Growing Up American: Dilemmas of the New Second Generation. The American Association for the Advancement of Science Annual Meeting, Baltimore. February 10, 1996.

Immigration and Schooling in Contemporary Societies. Invited paper read to the Culture, Psychology, and Education Conference, Harvard Graduate School of Education. January 12, 1995.

The Political, Cultural, and Psychological Aspects of Immigration. Invited paper read to the Workshop on the Political and Cultural Aspects of Immigration in America, Harvard College. December 9, 1995.

Writing a Grammar of Immigration. Invited paper read to the Monthly Latin American Faculty Luncheon, David Rockefeller Center for Latin American Studies, Harvard University. December 7, 1995.

Socio-Cultural Distopia and the Issue of Diversity. Invited paper read to the Conference Achievement: The Bell Curve is Not an Explanation. The Principals' Center, Harvard Graduate School of Education. October 5, 1995.

The Cultural Psychology of Immigration. Invited paper read (in absentia) to the Workshop on International Migration, Human Services Policies and Health. Granada, Spain, May 25 & 26, 1995.

Psychocultural Perspectives on Anti-Immigration. Invited paper read to the Conference on Psychoanalytic Perspectives on Neo-Fascism & Anti-Immigration Politics: Trends in Europe and the United States. Co-sponsored by the San Francisco Psychoanalytic Institute's Extension Division; the University of California at Berkeley's Center for Western European Studies, Doreen B. Townsend Center for the Humanities, and the Health and Medical Sciences Program. Alumni House, University of California, Berkeley May 6 & 7, 1995.

Impossible Attachments: The Need for Strangers and the Immigration Malaise. Invited paper presented to the Department of Anthropology, Harvard University, May 1, 1995.

What is Exclusion Anyway? A Psychocultural Approach to the Other Side of Inclusion. Invited paper presented to the Principals' Center Spring Conference, "What is Inclusion Anyway?" Harvard University Graduate School of Education, April 27, 1995.

Immigrant Families: A View from Cultural Psychology. Invited paper presented to the Department of Child Study, Tufts University, April 13, 1995.

Transformations: Generational Discontinuities of Immigration in Transnational Perspective. Tenure Review Lecture read to the Harvard University Graduate School of Education, April 6, 1995.

Psychoanalysis and Culture. Invited paper read to the Department of Human Development and Psychology, Harvard University Graduate School of Education, March 2, 1995.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 88 of 191 PageID #: 1970

Suárez-Orozco, Marcelo M.

Vita

Immigration: Setting the Context. Invited paper read to the Harvard Forum In or Out? Immigration and Proposition 187. Harvard University Graduate School of Education, February 15, 1995.

Language Minority Adolescents and School Success. Invited paper read to the Conference on Academic Achievement for Urban Adolescents. Harvard University Graduate School of Education, February 4, 1995.

California Dreaming: Proposition 187 and the Immigration Delirium. Invited paper read to the Colloquium in Human Development, Department of Human Development and Psychology, Harvard University Graduate School of Education, December 12, 1994.

Migration and Motivation. Invited paper read to the Russell Sage Foundation. New York City, November 17, 1994.

Recent Themes in Cultural Psychology. Paper read to the Boston Area Cultural Psychology Forum. Harvard University Graduate School of Education, October 14, 1994.

Migration and the Development of Interethnic Group Relations. Paper read to the Research Symposium on the Development of Interethnic Group Relations During Childhood and Adolescence. Carnegie Council on Adolescent Development. Washington, DC, September 29, 1994.

Democracy and Difference in the Post-Utopian Moment. Paper read (in absentia) to the International Conference on Democracy and Difference. University of Cape Town, South Africa, May 5-7, 1994.

The Organization of Hatred. Paper read to the University of California Interdisciplinary Psychoanalytic Consortium, UCLA Lake Arrowhead Conference Center, April 22-24, 1994.

Ethnic Malaise: Schooling Immigrants and Refugees in a Post-Utopian Moment. Paper read to the Department of Human Development, Harvard University, March 23, 1994.

Ethnographic Perspectives in Educational Analysis. Paper read to the International Workshop on Ethnographic Perspectives in Educational Analysis in the 1990s (Jointly Sponsored by the Unité de Sociologie de L'éducation, CNRS, Paris and the Fundación "la Caixa"). Barcelona, Spain, October 29, 1993.

Immigrant Cultural Psychology: Methodological Considerations. Paper read to the Department of Social Psychology, University of Barcelona, Spain, October 27, 1993.

Terror at the Fin de Siècle: The Systematization of Hatred in a Paranoid Era. Invited Paper read to the Biannual Meeting of the Society for Psychological Anthropology, Montreal, Canada, October 8, 1993.

Migration and Urban Education: The View from Brussels. Paper read (in absentia) to the Research Workshop on Educational Change and Educational Knowledge. Department of Curriculum and Instruction. University of Wisconsin, Madison, WI, June 18, 1993.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 89 of 191 PageID #: 1971

Suárez-Orozco, Marcelo M.

Vita

Latino Cultural Psychology: Family Life and the Patterning of Achievement Motivation Among Mexicans, Mexican Immigrants, Mexican Americans, and non-Hispanic "Mainstream" Adolescents. Paper presented to the Department of Psychology, University of California, Santa Cruz, CA, May 17, 1993.

Terror and Mimesis in the Continent of the 'Disappeareds.' Paper presented to the Center for Latin American Studies, University of California, Berkeley, CA, April 26, 1993.

Quo Vadis Anthropology? Partial Answers and a Guided Tour of Violin Playing in Four Cultures. Paper presented to the 'Wednesday Evening Seminar,' Center for Advanced Study in the Behavioral Sciences, Stanford, CA, April 14, 1993.

Anxious Neighbors: Immigrant Minorities in Belgium. Paper presented to the Research Workshop on Controlling Illegal Immigration: A Global Perspective. Center for U. S. - Mexican Studies, University of California, San Diego, La Jolla, CA, March 18-20, 1993.

Latino Immigrants in Urban Schools: Psycho-Cultural Perspectives. Paper presented to the Conference on Immigrant Students in California Schools. Center for U.S.-Mexican Studies, University of California, San Diego, La Jolla, CA, January 23, 1993.

Hot Wars, Cold Wars, Dirty Wars: Mourning and Memory in the Continent of the 'Disappears.' Paper presented to the Faculty Colloquium, Department of Anthropology, Stanford University, CA, October 19, 1992.

Immigrants in the U. S and Europe: A Framework for Comparison. Invited paper presented to the Graduate Group in Social Relations, University of California, Irvine, CA, May 7, 1992.

Minority Status and Urban Education: A Theoretical Framework for Comparisons. Paper presented to the Annual Meeting of the American Educational Research Association. San Francisco, CA, April 22, 1992.

Variability in Minority School Performance: Comments on Recent U. S. and European Findings. Invited paper presented to the Annual Meeting of the American Educational Research Association. San Francisco, CA, April 23, 1992.

Tortured Bodies: Towards a Semiotics of the Unspeakable. Invited paper presented to the Body Image: A Cross-Cultural Perspective Conference. The UCLA Center for Pacific Rim Studies, University of California, Los Angeles, CA, April 4, 1992.

The Cultural Psychology of Hispanic Immigrants: Implications for Educational Research. Invited paper presented the Cultural Diversity: Implications for Schools and Learning Conference. Center for Research on the Context of Secondary School Teaching, School of Education, Stanford University, Stanford, CA, October 5, 1991.

Die Grammatik des Terrors: psychosoziale Aspekte der Teleologie des Überlebenden. Fallbeispiele in den USA lebender Jugendlicher aus Mittelamerika. Invited paper presented to the Fifth Annual Meeting of the Congress on Culture and Psychosocial Conditions in Latin America. Department of Psychiatry, University of Hamburg, Germany, September 20, 1991.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 90 of 191 PageID #: 1972

Suárez-Orozco, Marcelo M.

Vita

Migration, Mental Health, and Education: Recent Developments in United States and European Research. Invited paper presented to the Biennial Congress of the World Federation for Mental Health. Mexico City, Mexico, August 19, 1991.

Educating Migrant Youths in Europe and the United States. Invited paper presented at the congress on Advances in Education. Universidad de las Americas, Mexico City, Mexico, August 17, 1991.

The Anthropology of Diversity. Invited paper presented to the IRA Lecture Series, College of Health and Human Services, San Diego State University, San Diego, CA, February 26, 1991.

Studying Fantasy Cross-Culturally: The Thematic Apperception Test in Anthropological Research. Invited paper presented to the Institute of Personality Assessment and Research, University of California, Berkeley, CA, February 19, 1991.

Culture, Society and Schooling in Plural Settings: Comparative Dilemmas and Opportunities in the 1990s. Invited paper presented to the conference on Recent Contributions to the Study of Culture, Society and Schooling in Plural Societies. Division of Education, University of California, Davis, CA, October 12, 1990.

Latin American Systems of Terror and their Aftermath: Anthropological and Psychological Perspectives. Invited paper presented to the conference on Children in War. Sigmund Freud Center, Hebrew University of Jerusalem, Israel, June 26, 1990.

Some Psychocultural Strategies for Research with Children in War. Invited paper presented to the conference on Children in War. Sigmund Freud Center, Hebrew University of Jerusalem, Israel, June 27, 1990.

Psychological Responses to Political Terror: The Argentine 'Dirty War' Paradigm. Paper presented to the Psychoanalytic Interdisciplinary Seminar. Department of Psychiatry, School of Medicine, University of California, San Diego, CA, June 12, 1990.

Comments on the Japanese Experience in Latin America. Invited paper presented to the conference on Japan's Relations with Latin America: Implications for the United States. Center for Iberian and Latin American Studies, University of California, San Diego, CA, April 27, 1990.

The Uncanny in the Continent of the 'Disappeareds.' From Mourning to Political Discourse in 'Dirty War' and Post 'Dirty War' Argentina. Paper presented to an invited session of the American Ethnological Society, Atlanta, GA, April 26, 1990.

Addressing Issues of Race and Culture in the Education of Minority Students: Some Reflections on Current U.S. and European Scholarship. Invited paper presented to the conference on Addressing Issues of Race, Culture & Gender in the Education of Minority Students. Southwest Center for Educational Equity. Palo Alto, CA, March 23rd, 1990.

Recent Currents in Cultural Anthropology. Invited paper presented to the Annual meeting of the International Baccalaureate Society. Los Angeles, CA, February 5th, 1990.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 91 of 191 PageID #: 1973

Suárez-Orozco, Marcelo M.

Vita

Celebrating Diversity: Minority Status and Educational Dilemmas in Europe and the U.S.-- Thoughts on Cross-Cultural Comparisons. Paper presented to the Celebrating Diversity Conference. California State Department of Education, State of California. Oakland, CA, January 19th, 1990.

Race, Ethnicity and Schooling: Current Themes in U.S. and European Research Findings. Paper presented to the Symposium on Race, Ethnicity and Schooling. Division of Education and Center for Cooperative Educational Research, University of California, Davis, CA, January 26th, 1990.

Towards a Psychosocial Understanding of Responses to Terror: The Case of New Arrivals from Central America in a U.S. Inner City. Paper presented to the Research Seminar, Center for US-Mexican Studies. University of California, San Diego, CA, May 31st, 1989.

Migration, Minority Status and the Future of Europe: Notes on the Prospectives of Cross-Cultural Comparisons. Paper presented to the Migration and Autonomy Colloquium. Center for Western European Studies, Institute of International Studies. University of California, Berkeley, CA, March 28th, 1989.

The Anthropology of Terror. Paper presented to a session of the American Anthropological Association 87th Annual Meeting, Phoenix, AZ, November 16-20, 1988.

A Grammar of Terror: Psycho-Cultural Responses to State Terrorism in 'Dirty War' and Post 'Dirty War' Argentina. Paper presented to an invited session of the American Anthropological Association 87th Annual Meeting, Phoenix, AZ, November 16-20, 1988.

Culture and Motivation. Paper presented to the Graduate School of Education, Stanford University, Stanford, CA, June 8th, 1988.

Psychocultural Aspects of Masculinity and Paternity in Latin America. Paper presented to the Conference on the Family. Department of Psychology, Sonoma State University, Sonoma, CA, May 14th, 1988.

Psychocultural Aspects of Motivation. Paper presented to the Dean's Seminar. Graduate School of Education, Stanford University, Stanford, CA, March 3rd, 1988.

Against all Odds: Hispanic Immigrants in Inner City Schools. Paper presented to the Stanford Dropout Conference. Stanford University, Stanford, CA, February 26th, 1988.

Survivors' Teleology and the Psycho-Cultural Exegesis of Human Motivation. Paper presented to a seminar of the Department of Anthropology, Princeton University, Princeton, NJ, February 5th, 1988.

Psychology and Culture in the Study of Human Motivation: A Theoretical Footnote from a Psycho-Social Ethnography. Paper presented to a seminar of the Department of Anthropology, University of California, Los Angeles, CA, January 6th, 1988.

'Becoming Somebody': Psycho-Cultural Aspects of Motivation among Central American Immigrants. Paper presented to a seminar of the Department of Anthropology, University of California, San Diego, CA, October 12th, 1987.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 92 of 191 PageID #: 1974

Suárez-Orozco, Marcelo M.

Vita

Some Psycho-Cultural Aspects of Human Motivation. Paper presented to a Symposium of the Linguistic Minority Research Institute, University of California, Santa Barbara, CA, May 16th, 1987.

The War to end all Worlds: Children and the Family in the Dirty Side of Argentina's 'Dirty War.' Paper presented to an invited session of the American Ethnological Society, San Antonio, TX, May 1st, 1987.

Hermes in the Barrios: A Psycho-Cultural Critique of Motivation Theory. Paper presented to the Department of Anthropology, The University of Chicago, Chicago, IL, April 27th, 1987.

Central Americans in the U.S.: A Study of Ethnic Adaptation and Adjustment. Paper presented to the Graduate School of Education, The University of Pennsylvania, PA, April 15th, 1987.

Sex and Power in Soccer and War: A Latin America Case Study. Paper presented to the University of California Symposium on Sex, Power and Sports: Male Perspectives. Berkeley, CA, April 2nd, 1987.

The Central American Culture of Terror in Thematic Apperception Narratives: A Psycho-Cultural Interpretation. Paper presented to a session of the 31st Annual Meeting of the Kroeber Anthropological Society. University of California, Berkeley, CA, March 7th, 1987.

Thinking About Motivation in Cultural Terms. Paper presented to the Office for Research on Educational Equity, Graduate School of Education, University of California, Santa Barbara, CA, February 27th, 1987.

Survival, Guilt and Achievement: Family Dynamics and the Psycho-Social Contexts of Motivation among Recent Immigrants from Central America. Paper presented to Educational Policy Studies, School of Education, University of Wisconsin-Madison, WI, June 1986.

Escape to Freedom: Intra-familial Dynamics among New Arrivals from War-torn Central America. Paper presented to the Anthropology Board of Studies, University of California, Santa Cruz, CA, May 1986.

Immigrant Adaptation: Theoretical Lessons from a Hispanic Case. Paper presented to an invited session of the American Anthropological Association 84th Annual Meeting, Washington, D.C., December 4-8, 1985.

Opportunity, Family Dynamics and Achievement: The Socio-Cultural Context of Motivation Among Recent Immigrants from Latin America. Paper presented to the University of California Symposium on Linguistic Minorities and Education. Tahoe City, CA, May 30th-June 1st, 1985.

International Migration and Psycho-Social Adaptation: The Case of the Hispanic Americans. Paper presented to the Symposium on Education and Cultural Identity: Hispanic America and Canada. Institute for International Studies, University of California, Berkeley, CA, April 1985.

A Psycho-Social Approach to Understanding Hispanic Adaptation to the U.S. Paper presented to a session of the American Anthropological Association 83rd Annual Meeting, Denver, CO, 1984.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 93 of 191 PageID #: 1975

Suárez-Orozco, Marcelo M.

Vita

Hispanic School Problems: An Anthropological Approach. Paper presented to a session of the Kroeber Anthropological Society 28th Annual Meeting, University of California, Berkeley, CA, 1984.

Macho Semiotics: The Image of Women in Latin American Male Folklore. Paper presented to a session of the Kroeber Anthropological Society 27th Annual Meeting, University of California, Berkeley, CA, 1983.

SERVICE

Chair of the Committee to Review the UCLA Vice Provost for Graduate Education & Dean of the Graduate Division, 2016.

Member of the Executive Advisory Board, UCLA David Geffen School of Medicine Center for Child Anxiety Resilience Education and Support [CARES], 2015-
<http://carescenter.ucla.edu/executive-advisory-board>

Trustee, Carnegie Foundation for the Advancement of Teaching, 2015- <http://bit.ly/1LJBKlk>

Member of the Advisory Board, X-Prize Global Learning, 2015- <http://bit.ly/1KnoWEV>

Member of the Board, Stiftung Universität Hildesheim, Education Research and Teacher Quality in Germany, 2015-

Chair of the Committee to Review the UCLA Vice Provost for International Studies, 2014.

Member of the Committee to Review the UCLA Dean of Social Sciences, 2014.

Member of the UC Links Review Committee, University of California. Office of the President, 2013-

Member of the Search Committee, Dean UCLA Extension School, 2013.

Member of the International Scientific Advisory Board, EU Seven Nation Study, Reducing Early School Leaving in the European Union, Brussels, 2012-

EVC-Provost Dean's Council 2012-

Member of the Editorial Board, Aztlán: A Journal of Chicano Studies, 2012-

Member of the UC Links Proposals Review Committee, Office of the President, University of California, 2012.

Member of the Research Advisory Committee, National Academy of Education, 2011-2015.

Member of the Search Committee, UCLA Extension Dean Search, 2012-13.

Suárez-Orozco, Marcelo M.

Vita

Member of the Fellowships Committee, The Paul and Daisy Soros Fellowship for New Americans, 2011–2012.

Member of the Admissions Committee, Department of Humanities and Social Sciences in the Professions, New York University, 2006-2007, 2007-2008, 2008-2009, and 2009-2010.

Member of the Faculty Board, New York University Press, 2009-2012.

Member of the Executive Committee, Center for Latin American and Caribbean Studies, New York University, 2009-

Member of the University-Wide Faculty Advisory Committee on Academic Priorities, New York University, 2007-2008.

Member of the Committee to Review University Professors, New York University, 2008.

Member of the Search Committee, Department of Communications, New York University, 2006-2007.

Member of the Committee to Review University Professors, New York University, 2005.

Member of the University-Wide Faculty Advisory Committee on Academic Priorities, New York University, 2005-2006.

Member of the Search Committee for the Director, Institute for Human Development and Contextual Change, New York University, 2005-2006.

Member of the Search Committee, Department of Social and Cultural Analysis, Faculty of Arts and Sciences, New York University, 2005-2006.

Member of the Advisory Committee, The Modern Language Association, A Map of Languages in the United States, 2005-2009

Member of the International Scholars Board of Advisors. Facing History and Ourselves, 2005-

Member of the Board of Directors, The Ross Institute for Advanced Study and Innovation in Education, 2005-2010.

Member of the International Education Search Committee. New York University, 2005.

Honorary Member of the Board, Ethnos: Investigación y Divulgación en Ciencias Humanas. Barcelona, Spain, 2003-

Member of the Advisory Board, American Anthropological Association Initiative on Understanding Race and Human Variation, 2002-2004.

Member of the Editorial Advisory Board, Harvard Journal of Hispanic Policy, John F. Kennedy School of Government, Harvard University, 2002-2005.

Member of the Graduate School of Education Dean Search Advisory Committee, Harvard University, 2001-2002.

Suárez-Orozco, Marcelo M.

Vita

Member of the Graduate School of Education Human Development and Psychology Search Committee, Harvard University, 2001-2002.

Member of the Harvard Committee on Employment and Contracting Policies ("Living Wage Committee"). (Senior Faculty Representative), Harvard University, 2001.

Member of the Gender Studies Advisory Committee, Harvard University Graduate School of Education, 2001.

Member of the Advisory Committee, Research Program on Cultural Contact, Russell Sage Foundation, 2001-2003

Member of the Series Advisory Board, Landscapes of Childhood, Wayne State University Press, 2000-2007.

Member of the Professorial Advisory Committee, Judge Baker Children's Center, Harvard Medical School, 2000-2003.

Member of the Selection Committee, Harvard Fellows on Race, Culture and Education, Harvard University Graduate School of Education 2000-2001.

Member of the Board of Directors, Society for Psychological Anthropology, American Anthropological Association, 1998-2001.

Nominator, MacArthur Fellows Program, The John D. and Catherine T. MacArthur Foundation, 1999.

Member of the Task Force, Weatherhead Center for International Affairs, Harvard University, 1998-99.

Member of the Advisory Committee, The Henry A. Murray Research Center of The Radcliffe Institutes for Advanced Study, 1997- 2001.

Member of the Editorial Board, Educational Researcher, American Educational Research Association, 1999-2000.

Member of the International Scientific Board Revista Investigación en Salud, Guadalajara, Jalisco, México, 1999-.

Member of the Faculty Advisory Board, Harvard University Native American Program, 1999-2003.

Chair of the Search Committee, Department of Human Development and Psychology. Harvard University Graduate School of Education, 1998.

Member of the American Anthropological Association Cultural Diversity Publication Committee, 1997-98.

Member of the International Education Search Committee, Harvard University Graduate School of Education, 1996-97.

Suárez-Orozco, Marcelo M.

Vita

Member of the Policy Committee. David Rockefeller Center for Latin American Studies, Harvard University, 1996-2003.

Member of the Search Committee. The Robert F. Kennedy Visiting Professorship in Latin American Studies. Harvard University, 1996-2003.

Member of the Steering Committee, Risk and Prevention Program, Harvard University Graduate School of Education, 1995-96.

Advisory Editor, Encyclopedia of American Immigrant Cultures, Human Relations Area Files, Yale, 1995-1997.

Member of the International Advisory Council, Center for U.S.-Mexican Studies, University of California, San Diego, 1995-2001.

Member of the Program Advisory Committee, Spencer Foundation, 1995-1996.

Member of the Committee on Degrees, Harvard University Graduate School of Education, 1995-96 and 1996-97.

Member of the Faculty Recruiting Committee, Harvard University Graduate School of Education, 1995-96 & 1997-98.

Senior Advisory Review Panel, Cultural Anthropology, National Science Foundation, 1994.

Member of the Committee on International Education, Harvard University Graduate School of Education, 1994-1995.

Outside Ph. D. Examiner, Department of Social Psychology, University of Barcelona (Spain), July and October 1993.

Associate Editor, Anthropology and Education Quarterly, 1988 to 1992.

Member of the Academic Advisory Council, Center for U.S.-Mexican Studies, University of California, San Diego, 1988 to 1990.

Contributing Editor, The Journal of Psychohistory, 1988.

Member of the Advisory Committee, Center for Iberian and Latin American Studies [CILAS], University of California, San Diego, 1988 to 1995.

Member of the Faculty Graduate Group in Latin American Studies, CILAS, University of California, San Diego, 1988 to 1995.

Member of the Faculty Group in Teacher Education, University of California, San Diego, 1988-1995.

Member of the Executive Committee, CILAS, University of California, San Diego, 1989 to 1995.

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 97 of 191 PageID #: 1979

Suárez-Orozco, Marcelo M.

Vita

Member of the Committee, Urban Studies Program, University of California, San Diego, 1990 to 1995.

Convening Member, Center for German and European Studies, University of California, Berkeley, 1991-1994.

Graduate Advisor, Department of Anthropology, University of California, San Diego, 1993 to 1994.

Undergraduate Advisor, Department of Anthropology, University of California, San Diego, 1988-1989 and 1989-1990.

AWARDS, FELLOWSHIPS, GRANTS & GIFTS

The Capital Campaign for UCLA GSE&IS (Chancellorian Goal of 70 Million by 2019; raised \$77 million by 2017)

Ford Foundation [Bridging the Compassion Gap] (Grant 2017-18, \$1,000,000)

Carnegie Corporation of New York [The UCLA School Network] (Grant 2016-2018, \$1,500,000)

Mrs. Courtney Ross [Humanism and Mass Migration] (Gift 2016, \$75,000)

Anonymous [Humanism and Mass Migration] (Gift 2016, \$50,000)

Spencer Foundation [Humanism and Mass Migration] (Grant 2016, \$35,000)

W. T. Grant Foundation [Humanism and Mass Migration] (Grant 2016, \$25,000)

Ford Foundation [Changing the Immigration Narrative] (Grant 2015-16, \$100,000)

The Spencer Foundation [Immigration, Social Cohesion, and Cultural Sustainability] Grant 2013-14, \$50,000)

Ford Foundation [The UndocuScholar Survey] (Grant 2013-14, \$100,000)

Anonymous [The UndocuScholar Survey] (Grant 2013-14, 32,000)

William T. Grant Foundation [The Role of Settings on Relational and Academic Engagement for Latino Community College Students] (Grant 2012-2013, \$25,000)

Ford Foundation [Research on Immigrants in Community College] (Grant 2011-12, \$350,000)

Carnegie Corporation of New York [Civic Trust and Engagement among Immigrant Youth: a Pilot Study] (Grant 2011-12, \$325,000)

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 98 of 191 PageID #: 1980

Suárez-Orozco, Marcelo M.

Vita

William T. Grant Foundation [The Role of Settings on Relational and Academic Engagement for Latino Community College Students] (Grant 2010-2012, \$499,201)

The Richard Fisher Membership, Institute for Advanced Study, Princeton, NJ (Fellowship, 2009-2010)

Covering Immigration: Academic and Journalistic Perspectives. Western Union Foundation. (Grant 2008-2009, \$10,000)

Pathways to Opportunity for the Children of Immigrants in North America and Europe. Western Union Foundation. (Grant 2008-2009, \$75,000)

The Bank of Sweden Tercentenary Foundation (Riksbankens Jubileumsfond, RJ), Electrum Foundation / Kista Science City, Microsoft, Swedish Research Council (Vetenskapsrådet) (with others) [Globalization and Learning] (Grant 1.2 M. Swedish Crowns)

William T. Grant Foundation [Longitudinal Immigrant Student Adaptation] (Grant 2003-2004 \$15,000)

Mrs. Courtney Ross Holst [Education for Globalization] (Gift 2003, \$30,000)

William T. Grant Foundation [Longitudinal Immigrant Student Adaptation] (Grant 2003-2004 \$25,000)

Mrs. Courtney Ross Holst [Education for Globalization] (Gift 2002, \$70,000)

Harvard University Provost's Fund for Interfaculty Initiatives [Immigration and Well-Being] (Grant 2000-20001, \$75,000)

Rockefeller Foundation of New York City [The New Americas] (Grant 2002-2006, \$245,000)

David Rockefeller Center for Latin American Studies, Harvard University (with Howard Gardner) [Education for Globalization] (Grant 2002 \$5,000)

Dean's Venture Fund, Graduate School of Education, Harvard University (with Howard Gardner) [Education for Globalization] (Grant 2002, \$29,500)

Spencer Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 2002-2003, \$380,800)

William T. Grant Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 2001-2002 \$200,000)

Spencer Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 2001-2002, \$50,000)

Spencer Foundation [Latinos in the 21st Century: Mapping the Research Agenda] (Grant 2000-2001, \$40,000)

Harvard University Provost's Fund for Interfaculty Initiatives [Latinos in the 21st Century: Mapping the Research Agenda] (Grant 2000-20001, \$10,000)

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 99 of 191 PageID #: 1981

Suárez-Orozco, Marcelo M.

Vita

William T. Grant Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 1999-2001, \$492,913)

Spencer Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 1997-2002, \$479,100)

National Science Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 1997-2002, \$768,129)

William T. Grant Foundation (with Carola Suárez-Orozco) [Longitudinal Immigrant Student Adaptation] (Grant 1997-2000, \$462,584)

Carnegie Corporation (with others) [Children's Studies at Harvard] (Grant, 1997-1999, over \$1,000,000).

David Rockefeller Center for Latin American Studies, Harvard University [Immigration and the Sociocultural Remaking of the North American Space] (Grant, 1997-1998)

The Center for International Affairs, Harvard University [New Developments in Mexican Immigration to the United States] (Grant, 1997-1998)

Bellagio Study and Conference Center, The Rockefeller Foundation, Como, Italy [Social Violence in Interdisciplinary Perspectives] (Residency Fellowship September, 1996)

Spencer Foundation [Migration and Urban Education: The Case of Mexican-Americans] (Grant, 1992-1993)

Center for Advanced Study in the Behavioral Sciences, Stanford, (Fellowship 1992-1993)

Center for German and European Studies, University of California, Berkeley [Migration and Urban Education: U. S./ Europe Comparisons] (Grants, 1991-1992 and 1992-1993)

National Science Foundation (with others) [Controlling Immigration: A Global Perspective] (Grant, 1991-1993)

Mellon Foundation Grant [Comparative Political Economy of Immigration] (Grant, 1991-1992)

Chancellor's Summer Faculty Fellowship, University of California, San Diego (1990)

Academic Senate Research Grant, University of California, San Diego (1990)

University of California Consortium on Mexico and the United States [UC-MEXUS] Grants (Grants, 1990 and 1991)

Academic Senate Research Grant, University of California, San Diego (1989)

Academic Senate Research Grant, University of California, San Diego (1988)

American Educational Research Association (Division G) Best Doctoral Dissertation Award (1988)

Suárez-Orozco, Marcelo M.

Vita

Tinker Field Research Grant (1988)

The Robert H. Lowie Graduate Scholarship, University of California, Berkeley (1985-1986)

The University of California Regents Fellowship (1983-1984)

The Wollemberg Scholarship, University of California, Berkeley (1980)

Phi Beta Kappa

The Undergraduate and Graduate Scholastic Honor Society, University of California, Berkeley

HONORS

Member of the American Academy of Arts and Sciences (Elected April 2014)

The Virginia and Warren Stone Prize, Awarded Annually by Harvard University Press for an Outstanding Book on Education and Society, 2008

Orden Mexicana del Águila Azteca (The Mexican Order of the Aztec Eagle), 2006

New York's 25 Most Influential Hispanics El Diario, New York City, 2005

Member of the National Academy of Education (Elected April 2004)

America's 100 Most Influential Hispanics. Hispanic Business Magazine, 2001

Master of Arts, Honoris Causa, Harvard University (1995)

ALANA (African, Latino, Asian and Native American) Outstanding Faculty Member Recognition Award. Harvard University (1995)

Social Policy Book Award, Society for Research on Adolescents, 1996 (For Transformations: Immigration, Family Life, and Achievement Motivation Among Latino Adolescents. Carola E. and Marcelo M. Suárez-Orozco. Stanford, CA: Stanford University Press. 1995)

The R. Boyer Award for Outstanding Research in Psychological Anthropology, University of California, Berkeley (1986)

Suárez-Orozco, Marcelo M.

Vita

COURSES

Fiat Lux Seminar: Reimagining Urban Education, UCLA
Globalization and Education, NYU Abu Dhabi
Culture and Human Development; Globalization and Education
Good Work in the Global Era (with Howard Gardner)
Psychological Anthropology; Cultural Psychology
Anthropology and Education;
Psycho-Social Problems in Changing Cultures;
Fieldwork Methods; Comparison of Cultures;
Immigration, Ethnicity, and Education;
Latino Cultures;
Introduction to Cultural Anthropology;
Latin American Societies and Cultures;
Contemporary Central America; Folklore;
Themes in Cross-Cultural Psychiatry (UCSD School of Medicine).

PERSONAL DATA

Citizenship: U.S. (born in Lomas de Zamora, Argentina, September 21, 1956)

Civil Status: Married to Carola Suárez-Orozco in January 1977. We have two children, Marisa Suárez-Orozco (born in San Francisco, CA, 12/31/1983) and Lucas Suárez-Orozco (born in San Diego, CA, 3/9/1990)

REFERENCES

Danielle Allen, Director, Edmond J. Safra Center for Ethics at Harvard University
Professor, Department of Government and Graduate School of Education, Harvard University

James A. Banks, The Kerry and Linda Killinger Endowed Chair in Diversity Studies and
Director of the Center for Multicultural Education at the University of Washington, Seattle

Gene Block, UCLA Chancellor

John H. Coatsworth, Provost of Columbia University

Howard Gardner, The John H. and Elisabeth A. Hobbs Professor of Cognition and Education,
Harvard University, Graduate School of Education

Kathleen McCartney, President, Smith College

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 102 of 191 PageID #: 1984

Suárez-Orozco, Marcelo M.

Vita

Gary Orfield, Professor of Education, Law, Political Science and Urban Planning & Co-Director, Civil Rights Project/Proyecto Derechos Civiles at UCLA

Cristina M. Rodríguez, Professor of Law, Yale Law School

Roberto Suro, Professor of Communication, the Annenberg School for Communication & Journalism; Professor of Policy, School of Policy, Planning and Development; and Director The Tomás Rivera Policy Institute University of Southern California

Scott Waugh, UCLA Provost and Executive Vice Chancellor

Mary Waters, The M. E. Zuckerman Professor of Sociology, Harvard University

* Refereed Publication

July 2017

EXHIBIT U

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 104 of 191 PageID #: 1986

JEFFREY M. DAVIDSON (SBN 248620)
ALAN BERSIN (SBN 63874)
COVINGTON & BURLING LLP
One Front Street, 35th Floor
San Francisco, CA 94111-5356
Telephone: (415) 591-6000
Facsimile: (415) 591-6091
Email: jdavidson@cov.com,
abersin@cov.com
*Attorneys for Plaintiffs The Regents of the
University of California and Janet Napolitano, in
her official capacity as President of the
University of California*

THEODORE J. BOUTROUS, JR. (SBN 132099)
ETHAN D. DETTMER (SBN 196046)
JESSE S. GABRIEL (SBN 263137)
GIBSON, DUNN & CRUTCHER LLP
333 South Grand Avenue
Los Angeles, CA 90071-3197
Telephone: (213) 229-7000
Facsimile: (213) 229-7520
Email: tboutrous@gibsondunn.com,
edettmer@gibsondunn.com,
jgabriel@gibsondunn.com
*Attorneys for Plaintiffs Dulce Garcia, Miriam
Gonzalez Avila, Saul Jimenez Suarez, Viridiana
Chabolla Mendoza, Norma Ramirez, and Jirayut
Latthivongskorn*

XAVIER BECERRA
Attorney General of California
MICHAEL L. NEWMAN
Supervising Deputy Attorney General
JAMES F. ZAHRADKA II (SBN 196822)
1515 Clay Street, 20th Floor
P.O. Box 70550
Oakland, CA 94612-0550
Telephone: (510) 879-1247
Email: James.Zahradka@doj.ca.gov
Attorneys for Plaintiff State of California

JOSEPH W. COTCHETT (SBN 36324)
NANCY L. FINEMAN (SBN 124870)
COTCHETT, PITRE & MCCARTHY, LLP
San Francisco Airport Office Center
840 Malcolm Road, Suite 200
Burlingame, CA 94010
Telephone: (650) 697-6000
Facsimile: (650) 697-0577
Email: nfineman@cpmlegal.com
Attorneys for Plaintiff City of San Jose

JONATHAN WEISSGLASS (SBN 185008)
STACEY M. LEYTON (SBN 203827)
ERIC P. BROWN (SBN 284245)
ALTSHULER BERZON LLP
177 Post Street, Suite 300
San Francisco, CA 94108
Telephone: (415) 421-7151
Facsimile: (415) 362-8064
Email: jweissglass@altber.com
*Attorneys for Plaintiffs County of Santa Clara and
Service Employees International Union Local 521*

**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION**

THE REGENTS OF THE UNIVERSITY OF
CALIFORNIA and JANET NAPOLITANO,
in her official capacity as President of the
University of California,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
SECURITY and ELAINE DUKE, in her
official capacity as Acting Secretary of the
Department of Homeland Security,

Defendants.

CASE NO. 17-CV-05211-WHA

DECLARATION OF EMILY NISHI

STATE OF CALIFORNIA, STATE OF
MAINE, STATE OF MARYLAND, and
STATE OF MINNESOTA,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
SECURITY, ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security, and the UNITED
STATES OF AMERICA,

Defendants.

CASE NO. 17-CV-05235-WHA

CITY OF SAN JOSE, a municipal corporation,

Plaintiffs,

v.

DONALD J. TRUMP, President of the United
States, in his official capacity, ELAINE C.
DUKE, in her official capacity, and the
UNITED STATES OF AMERICA,

Defendants.

CASE NO. 17-CV-05329-WHA

DULCE GARCIA, MIRIAM GONZALEZ
AVILA, SAUL JIMENEZ SUAREZ,
VIRIDIANA CHABOLLA MENDOZA,
NORMA RAMIREZ, and JIRAYUT
LATTHIVONGSKORN,

Plaintiffs,

v.

UNITED STATES OF AMERICA, DONALD
J. TRUMP, in his official capacity as President
of the United States, U.S. DEPARTMENT OF
HOMELAND SECURITY, and ELAINE
DUKE, in her official capacity as Acting
Secretary of Homeland Security,

Defendants.

CASE NO. 17-CV-05380-WHA

COUNTY OF SANTA CLARA and
SERVICE EMPLOYEES INTERNATIONAL
UNION LOCAL 521,

Plaintiffs,

v.

DONALD J. TRUMP, in his official capacity
as President of the United States, JEFFERSON
BEAUREGARD SESSIONS, in his official
capacity as Attorney General of the United
States; ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security; and U.S.
DEPARTMENT OF HOMELAND
SECURITY,

Defendants.

CASE NO. 17-CV-05813-WHA

1 I, Emily Nishi, declare and state as follows:

- 2 1. I am over the age of eighteen and competent to testify.
- 3 2. I am Chief People Officer at Lyft, Inc. ("Lyft"). I am responsible for managing the
- 4 company's human resources strategy. I have been employed at Lyft since 2017.
- 5 3. Lyft employs more than 1,000 employees in the State of California and more than
- 6 2,000 employees in the United States.
- 7 4. At least one Lyft employee is a grantee under the Deferred Action for Childhood
- 8 Arrivals program ("DACA"), and we, like most large U.S. companies, believe that
- 9 other employees may have chosen not to self-identify. This employee works as a
- 10 software engineer and used to be located in California and is now located in
- 11 Washington. If this employee loses his DACA status and is deported, Lyft will
- 12 suffer great injury. He is one of our top engineers and is a key member of the team
- 13 driving critical data projects. This employee's work has contributed significantly to
- 14 Lyft and losing his talents and institutional knowledge would create a gap that
- 15 would be difficult to quantify.
- 16 5. Lyft connects millions of individuals of all backgrounds every day through the
- 17 experience of sharing a ride. At a time when so many forces are driving division in
- 18 our society, these shared moments of human connection can help bridge those gaps
- 19 and bring people and communities together. At Lyft, we are working towards a
- 20 community that is diverse, inclusive, and safe. These are fundamental values of our
- 21 company and we will always stand with those fighting for them.
- 22

23 I declare under penalty of perjury under the laws of the United States that the foregoing is

24 true and correct and that this declaration was executed on October 18, 2017, in San Francisco,

25 California.

26 

27 EMILY NISHI

EXHIBIT V

1 JEFFREY M. DAVIDSON (SBN 248620)
 2 ALAN BERSIN (SBN 63874)
 3 COVINGTON & BURLING LLP
 4 One Front Street, 35th Floor
 5 San Francisco, CA 94111-5356
 6 Telephone: (415) 591-6000
 7 Facsimile: (415) 591-6091
 8 Email: jdavidson@cov.com,
 9 abersin@cov.com
 10 *Attorneys for Plaintiffs The Regents of the*
 11 *University of California and Janet Napolitano, in*
 12 *her official capacity as President of the*
 13 *University of California*
 14 THEODORE J. BOUTROUS, JR. (SBN 132099)
 15 ETHAN D. DETTMER (SBN 196046)
 16 JESSE S. GABRIEL (SBN 263137)
 17 GIBSON, DUNN & CRUTCHER LLP
 18 333 South Grand Avenue
 19 Los Angeles, CA 90071-3197
 20 Telephone: (213) 229-7000
 21 Facsimile: (213) 229-7520
 22 Email: tboutrous@gibsondunn.com,
 23 edettmer@gibsondunn.com,
 24 jgabriel@gibsondunn.com
 25 *Attorneys for Plaintiffs Dulce Garcia, Miriam*
 26 *Gonzalez Avila, Saul Jimenez Suarez, Viridiana*
 27 *Chabolla Mendoza, Norma Ramirez, and Jirayut*
 28 *Latthivongsorn*

XAVIER BECERRA
 Attorney General of California
 MICHAEL L. NEWMAN
 Supervising Deputy Attorney General
 JAMES F. ZAHRADKA II (SBN 196822)
 1515 Clay Street, 20th Floor
 P.O. Box 70550
 Oakland, CA 94612-0550
 Telephone: (510) 879-1247
 Email: James.Zahradka@doj.ca.gov
Attorneys for Plaintiff State of California

JOSEPH W. COTCHETT (SBN 36324)
 NANCY L. FINEMAN (SBN 124870)
 COTCHETT, PITRE & MCCARTHY, LLP
 San Francisco Airport Office Center
 840 Malcolm Road, Suite 200
 Burlingame, CA 94010
 Telephone: (650) 697-6000
 Facsimile: (650) 697-0577
 Email: nfineman@cpmlegal.com
Attorneys for Plaintiff City of San Jose

JONATHAN WEISSGLASS (SBN 185008)
 STACEY M. LEYTON (SBN 203827)
 ERIC P. BROWN (SBN 284245)
 ALTSHULER BERZON LLP
 177 Post Street, Suite 300
 San Francisco, CA 94108
 Telephone: (415) 421-7151
 Facsimile: (415) 362-8064
 Email: jweissglass@altber.com
Attorneys for Plaintiffs County of Santa Clara and
Service Employees International Union Local 521

**UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA
 SAN FRANCISCO DIVISION**

THE REGENTS OF THE UNIVERSITY OF
 CALIFORNIA and JANET NAPOLITANO,
 in her official capacity as President of the
 University of California,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
 SECURITY and ELAINE DUKE, in her
 official capacity as Acting Secretary of the
 Department of Homeland Security,

Defendants.

CASE NO. 17-CV-05211-WHA

DECLARATION OF DR. JOHN D. STOBO

1 STATE OF CALIFORNIA, STATE OF
2 MAINE, STATE OF MARYLAND, and
STATE OF MINNESOTA,

3 Plaintiffs,

4 v.

5 U.S. DEPARTMENT OF HOMELAND
6 SECURITY, ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
7 of Homeland Security, and the UNITED
STATES OF AMERICA,

8 Defendants.

CASE NO. 17-CV-05235-WHA

9 CITY OF SAN JOSE, a municipal corporation,

10 Plaintiffs,

11 v.

12 DONALD J. TRUMP, President of the United
13 States, in his official capacity, ELAINE C.
DUKE, in her official capacity, and the
14 UNITED STATES OF AMERICA,

15 Defendants.

CASE NO. 17-CV-05329-WHA

16 DULCE GARCIA, MIRIAM GONZALEZ
17 AVILA, SAUL JIMENEZ SUAREZ,
VIRIDIANA CHABOLLA MENDOZA,
18 NORMA RAMIREZ, and JIRAYUT
LATTHIVONGSKORN,

19 Plaintiffs,

20 v.

21 UNITED STATES OF AMERICA, DONALD
J. TRUMP, in his official capacity as President
22 of the United States, U.S. DEPARTMENT OF
HOMELAND SECURITY, and ELAINE
23 DUKE, in her official capacity as Acting
Secretary of Homeland Security,

24 Defendants.

CASE NO. 17-CV-05380-WHA

COUNTY OF SANTA CLARA and
SERVICE EMPLOYEES INTERNATIONAL
UNION LOCAL 521,

Plaintiffs,

v.

DONALD J. TRUMP, in his official capacity
as President of the United States, JEFFERSON
BEAUREGARD SESSIONS, in his official
capacity as Attorney General of the United
States; ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security; and U.S.
DEPARTMENT OF HOMELAND
SECURITY,

Defendants.

CASE NO. 17-CV-05813-WHA

1 I, JOHN D. STOBO, DECLARE:

2 1. I am Executive Vice President of University of California Health ("UC Health"). The
3 matters set forth herein are true and correct of my own personal knowledge and, if called as a witness, I
4 could and would testify competently thereto.

5 2. I have been a physician for over 40 years. Prior to joining the University of California, I
6 served as president at the University of Texas Medical branch from 1997 to 2007. Before that, I was the
7 William Osler Professor of Medicine and Physician-in-Chief of the Johns Hopkins Hospital. I am a
8 member of the Institute of Medicine, and I have held leadership positions in a wide variety of national
9 professional organizations, including the American Association of Professors of Medicine, the American
10 College of Rheumatology, the American Board of Internal Medicine and the American Board of Internal
11 Medicine Foundation.

12 3. I have been working at the University of California ("UC") since October 2008. I am
13 responsible for system-wide coordination and communication among UC's health sciences schools and
14 medical centers, collectively referred to as UC Health.

15 4. UC Health is the third largest healthcare provider in California, and has the nation's
16 largest health sciences educational system. UC Health educates over 50% of California physicians. I am
17 responsible for policy development for UC's health system, and I monitor the performance for the
18 system's 17 health sciences schools and 14 hospitals on five campuses.

19 5. UC Health's mission is to improve health and wellness and positively impact quality, cost
20 and access to healthcare in California. UC Health measures this impact in part through community
21 benefit: care for the under-insured and un-insured, education of medical professionals and future health
22 leaders and medical research. UC Health, as part of the University of California's public service
23 mission, aims to address the needs of all populations in California and educate a workforce that will be
24 able to effectively serve populations with limited or unequal access to healthcare.

25 6. The rescission of the Deferred Action for Childhood Arrivals ("DACA") policy threatens
26 our ability to achieve this mission. UC Health medical schools have at least twelve DACA recipients.
27 DACA recipients in UC's medical schools have unique potential to practice in critical geographic areas
28 and specialties that might otherwise remain underserved. Without the DACA policy, these students will

1 lose the employment authorization necessary to become medical residents and eventually practicing
2 doctors that California needs.

3 7. There is an acute shortage of doctors in certain areas of California, including rural areas,
4 the San Fernando Valley, and particular urban areas. The shortage is an issue across the U.S. and is
5 projected to worsen through 2030. The challenge is one of distribution; physicians tend to become
6 concentrated in more affluent areas and urban centers. There are also shortages of doctors in certain
7 critical specialties, such as general surgery, general psychiatry, and primary care. Producing more
8 doctors through larger classes or new medical schools will not alleviate these geographic and specialty
9 distribution issues across California.

10 8. UC Health is focused on creating a workforce of physicians to address this shortage and,
11 as such, carefully selects its entering classes to meet the anticipated healthcare needs of California in the
12 decades to come. Achieving our mission means ensuring the students in the class transition into
13 residency and then medical practice. For example, our Programs in Medical Education ("PRIME")
14 program exemplifies the importance UC Health places on recruiting diverse and talented doctors
15 committed to serving communities that need them in California. PRIME's purpose is to meet the needs
16 of California's medically underserved populations in both rural communities and urban areas through
17 specialized training. The PRIME program started in 2004, and tailored versions of PRIME later rolled
18 out to every UC campus with a medical school. PRIME looks for medical school candidates who have
19 leadership qualities and are experienced with and committed to working with underserved populations.
20 The program combines specialized coursework, clinical experiences and mentoring in a tailored way
21 that prepares future physician leaders to provide care to specific underserved populations of nearby
22 regions. For example, the UC Irvine PRIME program focuses on the growing needs of California's
23 Latino communities. The UC San Francisco and the UC Berkeley Joint Medical Program focus on urban
24 underserved population healthcare delivery.

25 9. The rescission of the DACA policy will impair UC Health's efforts, such as PRIME, to
26 recruit and train doctors who are statistically more likely to serve the communities and the medical
27 specializations that California desperately needs. Research indicates that diverse doctors, like our DACA
28 students, are more likely to enter into specialties and practice in geographic regions with the greatest

1 shortage of physician services. A powerful indicator of where a medical student is likely to practice is
2 where they are from, so training exceptional students with ties to underserved areas increases the
3 likelihood that such areas will have more physicians in the future. Research also indicates that
4 physicians from minority populations are more effective in serving those same populations because of
5 improved engagement with patients. Improved healthcare delivery and outcomes drive down health
6 costs, improve community health, and increase the likelihood of economic success in that community.
7 Our DACA students are essential to achieving these powerful healthcare outcomes.

8 10. The rescission of the DACA policy is likely to prevent our DACA students from
9 completing, or even from starting, their residency training as physicians, since they will not be able to
10 work legally without employment authorization. The rescission of the DACA policy will therefore make
11 it more difficult for UC Health to deliver the kind of diverse next generation of physicians that UC
12 Health believes is critical for California.

13 11. I expect that the rescission of the DACA policy will also have an impact on patient care
14 in California's immigrant communities. Based on my experience, undocumented immigrants in general
15 are less likely to seek healthcare because they fear immigration enforcement at hospitals and healthcare
16 facilities. I believe this chilling effect would be particularly acute if our DACA medical students or
17 residents were also subject to immigration enforcement.

18 12. Moreover, the rescission of the DACA policy puts directly at risk UC Health's significant
19 investment of time and money into recruiting, retaining, and supporting its DACA-recipient students.
20 The tuition fees paid by a medical student cover less than half the cost of the student's education,
21 including residency. UC Health funds the remainder of the cost. UC Health will lose its significant
22 investment in each DACA student if that student is unable to finish school or become a practicing doctor
23 without DACA.

24 13. I am concerned that the rescission of the DACA program is likely to result in a higher
25 attrition rate for our DACA students. Medical students at UC Health are highly qualified, carefully
26 screened, and closely supported by each school. As a result, most students who start medical school at
27 UC also finish medical school; the attrition rate is otherwise quite low. However, the futility of
28 completing a medical degree without work authorization and incurring the significant debt that often

1 comes with that education and training increases the likelihood that our DACA students will not finish
2 medical school. If this occurs, both UC Health and the student will lose their investment in medical
3 training to date.

4 I declare under penalty of perjury under the laws of the United States that the foregoing is true
5 and correct.

6 Executed on October 26, 2017 in Oakland, California.

7
8 
9 JOHN D. STOBO

EXHIBIT W



U.S. Department of
Homeland Security

Frequently Asked Questions: Rescission Of Deferred Action For Childhood Arrivals (DACA)

Release Date: September 5, 2017

[En español \(https://www.dhs.gov/news/2017/09/05/preguntas-frecuentes-anulaci-n-de-la-acci-n-diferida-para-los-llegados-en-la\)](https://www.dhs.gov/news/2017/09/05/preguntas-frecuentes-anulaci-n-de-la-acci-n-diferida-para-los-llegados-en-la)

The following are frequently asked questions on the September 5, 2017 Rescission of the Deferred Action for Childhood Arrivals (DACA) Program.

Q1: Why is DHS phasing out the DACA program?

A1: Taking into consideration the federal court rulings in ongoing litigation, and the September 4, 2017 letter from the Attorney General, it is clear that program should be terminated. As such, the Acting Secretary of Homeland Security rescinded the June 15, 2012 memorandum establishing the DACA program. Please see the Attorney General's letter and the Acting Secretary of Homeland Security's memorandum for further information on how this decision was reached.

Q2: What is going to happen to current DACA holders?

A2: Current DACA recipients will be permitted to retain both the period of deferred action and their employment authorization documents (EADs) until they expire, unless terminated or revoked. DACA benefits are generally valid for two years from the date of issuance.

Q3: What happens to individuals who currently have an initial DACA request pending?

A3: Due to the anticipated costs and administrative burdens associated with rejecting all pending initial requests, USCIS will adjudicate—on an individual, case-by-case basis—all

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 118 of 191 PageID #: 2000
properly filed DACA initial requests and associated applications for EADs that have been accepted as of September 5, 2017.

Q4: What happens to individuals who currently have a request for renewal of DACA pending?

A4: Due to the anticipated costs and administrative burdens associated with rejecting all pending renewal requests, USCIS adjudicate—on an individual, case-by-case basis—properly filed pending DACA renewal requests and associated applications for Employment Authorization Documents from current beneficiaries that have been accepted as of September 5, 2017, and from current beneficiaries whose benefits will expire between September 5, 2017 and March 5, 2018 that have been accepted as of October 5, 2017. USCIS will reject all requests to renew DACA and associated applications for EADs filed after October 5, 2017.

Q5: Is there still time for current DACA recipients to file a request to renew their DACA?

A5: USCIS will only accept renewal requests and associated applications for EADs for the class of individuals described above in the time period described above.

Q6: What happens when an individual's DACA benefits expire over the course of the next two years? Will individuals with expired DACA be considered illegally present in the country?

A6: Current law does not grant any legal status for the class of individuals who are current recipients of DACA. Recipients of DACA are currently unlawfully present in the U.S. with their removal deferred. When their period of deferred action expires or is terminated, their removal will no longer be deferred and they will no longer be eligible for lawful employment.

Only Congress has the authority to amend the existing immigration laws.

Q7: Once an individual's DACA expires, will their case be referred to ICE for enforcement purposes?

A7: Information provided to USCIS in DACA requests will not be proactively provided to ICE and CBP for the purpose of immigration enforcement proceedings, unless the requestor meets the criteria for the issuance of a Notice To Appear or a referral to ICE under the criteria set forth in USCIS' Notice to Appear guidance (www.uscis.gov/NTA (<http://www.uscis.gov/NTA>)). This policy, which may be modified, superseded, or rescinded at any time without notice, is not

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 119 of 191 PageID #: 2001
intended to, does not, and may not be relied upon to create any right or benefit, substantive or procedural, enforceable by law by any party in any administrative, civil, or criminal matter.

Q8: Will USCIS share the personal information of individuals whose pending requests are denied proactively with ICE for enforcement purposes?

A8: Generally, information provided in DACA requests will not be proactively provided to other law enforcement entities (including ICE and CBP) for the purpose of immigration enforcement proceedings unless the requestor poses a risk to national security or public safety, or meets the criteria for the issuance of a Notice To Appear or a referral to ICE under the criteria. This policy, which may be modified, superseded, or rescinded at any time without notice, is not intended to, does not, and may not be relied upon to create any right or benefit, substantive or procedural, enforceable by law by any party in any administrative, civil, or criminal matter.

Q9: Can deferred action received pursuant to DACA be terminated before it expires?

A9: Yes. DACA is an exercise of deferred action which is a form of prosecutorial discretion. Hence, DHS will continue to exercise its discretionary authority to terminate or deny deferred action at any time when immigration officials determine termination or denial of deferred action is appropriate.

Q10: Can DACA recipients whose valid EAD is lost, stolen or destroyed request a new EAD during the phase out?

A10: If an individual's still-valid EAD is lost, stolen, or destroyed, they may request a replacement EAD by filing a new Form I-765.

Q11: Will DACA recipients still be able to travel outside of the United States while their DACA is valid?

A11: Effective September 5, 2017, USCIS will no longer approve any new Form I-131 applications for advance parole under standards associated with the DACA program. Those with a current advance parole validity period from a previously-approved advance parole application will generally retain the benefit until it expires. However, CBP will retain the authority it has always exercised in determining the admissibility of any person presenting at the border. Further, USCIS retains the authority to revoke or terminate an advance parole document at any time.

Q12: What happens to individuals who have pending requests for advance parole to travel outside of the United States?

A12: USCIS will administratively close all pending Form I-131 applications for advance parole under standards associated with the DACA program, and will refund all associated fees.

Q13: How many DACA requests are currently pending that will be impacted by this change? Do you have a breakdown of these numbers by state?

A13: There were 106,341 requests pending as of August 20, 2017 – 34,487 initial requests and 71,854 renewals. We do not currently have the state-specific breakouts.

Q14: Is there a grace period for DACA recipients with EADs that will soon expire to make appropriate plans to leave the country?

A14: As noted above, once an individual's DACA and EAD expire—unless in the limited class of beneficiaries above who are found eligible to renew their benefits—the individual is no longer considered lawfully present in the United States and is not authorized to work. Persons whose DACA permits will expire between September 5, 2017 and March 5, 2018 are eligible to renew their permits. No person should lose benefits under this memorandum prior to March 5, 2018 if they properly file a renewal request and associated application for employment authorization.

Q15: Can you provide a breakdown of how many DACA EADs expire in 2017, 2018, and 2019?

A15: From August through December 2017, 201,678 individuals are set to have their DACA/EADs expire. Of these individuals, 55,258 already have submitted requests for renewal of DACA to USCIS.

In calendar year 2018, 275,344 individuals are set to have their DACA/EADs expire. Of these 275,344 individuals, 7,271 have submitted requests for renewal to USCIS.

From January through August 2019, 321,920 individuals are set to have their DACA/EADs expire. Of these 321,920 individuals, eight have submitted requests for renewal of DACA to USCIS.

Q16: What were the previous guidelines for USCIS to grant DACA?

A16: Individuals meeting the following categorical criteria could apply for DACA if they:

- Were under the age of 31 as of June 15, 2012;
- Came to the United States before reaching their 16th birthday;
- Have continuously resided in the United States since June 15, 2007, up to the present time;
- Were physically present in the United States on June 15, 2012, and at the time of making their request for consideration of deferred action with USCIS;
- Had no lawful status on June 15, 2012;
- Are currently in school, have graduated, or obtained a certificate of completion from high school, have obtained a General Educational Development (GED) certificate, or are an honorably discharged veteran of the Coast Guard or Armed Forces of the United States; and
- Have not been convicted of a felony, significant misdemeanor, three or more other misdemeanors, and do not otherwise pose a threat to national security or public safety.

Topics: [Border Security \(/topics/border-security/\)](/topics/border-security/), [Deferred Action \(/topics/deferred-action/\)](/topics/deferred-action/)

Keywords: [DACA \(/keywords/daca/\)](/keywords/daca/), [Deferred Action for Childhood Arrivals \(/keywords/deferred-action-childhood-arrivals/\)](/keywords/deferred-action-childhood-arrivals/)

Last Published Date: September 5, 2017

EXHIBIT X

Supporting

Declaration of Karen C.

Tumlin



**U.S. Citizenship and
Immigration Services**

Frequently Asked Questions: Rejected DACA Requests

Specific guidance will be provided soon about the steps that a DACA recipient must take to resubmit his or her renewal request to USCIS if the filing was rejected due to U.S. Postal Service mail-service delays.

Q1: Are any new DACA requests being accepted?

A1: No. The DACA policy for accepting new, initial DACA requests ended on Sept. 5, 2017.

Q2: Can I still submit a DACA renewal request?

A2: No. The due date for DACA renewal requests was Sept. 5, 2017 for recipients whose DACA expired before Sept. 5, 2017, and Oct. 5, 2017 for recipients whose DACA expired between Sept. 5, 2017 and March 5, 2018.

Q3: I believe that my DACA request was delivered by the deadline, but since it wasn't officially "received" by USCIS until the following day, my request was rejected and returned to me. What do I need to do to have my DACA request reconsidered?

A3: USCIS will identify you and will send you a letter inviting you to resubmit your DACA request. You will have 33 days from the date of the letter to resubmit your request. You may wish to keep a copy of all materials included in your resubmission. USCIS expects to be able to identify and send letters to all persons in this situation.

Q4: I believe that my DACA request was delivered by the deadline, but since it wasn't officially "received" by USCIS until the following day, my request was rejected and returned to me. However, I haven't been contacted by USCIS to resubmit my DACA request. What should I do?

A4: If you believe your DACA request was delivered by the filing deadline but have not been contacted by USCIS to resubmit your request, you may contact Lockbox Support and explain your situation prior to resubmitting your package for reconsideration. To contact Lockbox Support please email lockboxsupport@uscis.dhs.gov. Provide any information you feel is relevant to your belief that your DACA request was received by USCIS in a timely manner.

Q5: What will happen if my current DACA expires before my renewal is processed? Will I be at risk of removal while this issue is being resolved?

A5: Consistent with longstanding USCIS policy, you will not have deferred action if there is a gap of time between the end of your current DACA and the agency's adjudication of your renewal request. Therefore it is very important for you to resubmit your renewal request as soon as possible.

Information provided to USCIS for the DACA process will not make you an immigration priority for that reason alone. That information will only be proactively provided to ICE or CBP if the requestor meets the criteria for the issuance of a Notice To Appear or a referral to ICE under the criteria set forth in USCIS' Notice to Appear guidance (www.uscis.gov/NTA). This information-sharing policy has not changed in any way since it was first announced, including as a result of the Sept 5, 2017 memo starting a wind-down of the DACA policy. This policy, which may be modified, superseded, or rescinded at any time with or without notice (as has always been the case, and is noted in the archived USCIS DACA FAQs), is not intended to, and may not be relied upon to create any right or benefit, substantive or procedural, enforceable by law by any party in any administrative, civil, or criminal matter.

Q6: If my DACA renewal request is approved after expiration of my current DACA, will the renewed deferred action apply retroactively?

A6: No. In accordance with longstanding policy, an approved DACA request will not apply retroactively. An individual's deferred action under the DACA policy begins the day USCIS approves the renewal request and is generally valid for two years from the date of issuance.

Q7: I submitted my renewal request on time, but it was rejected by USCIS for other reasons. Can I resubmit it again?

A7: If USCIS rejected your timely filed renewal request because it was not properly filed, that is a valid reason for rejection and it will not be reconsidered. However, if you believe your request was improperly rejected, i.e., it did include all required documents and information, and was properly signed and accompanied by the required fee or approved fee exemption, you may contact Lockbox Support for more information. The email address for Lockbox Support is lockboxsupport@uscis.dhs.gov. Please be prepared to identify and provide a detailed description of the error you believe was made. If you identify a clear error by USCIS in the processing of your renewal request, USCIS may exercise its discretion to review your request again.

11/30/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 124 of 191 PageID #: 2006

The above FAQs, which may be modified, superseded, or rescinded at any time with or without notice, are not intended to do not, and may not be relied upon to create any right or benefit, substantive or procedural, enforceable by law by any party in any administrative, civil, or criminal matter.

Last Reviewed/Updated: 11/30/2017

EXHIBIT Y

the WHITE HOUSE PRESIDENT DONALD J. TRUMP



From the Press Office

Speeches & Remarks

[Press Briefings](#)

[Statements & Releases](#)

[Nominations & Appointments](#)

[Presidential Actions](#)

[Legislation](#)

[Disclosures](#)

The White House

Office of the Press Secretary

For Immediate Release

February 16, 2017

Remarks by President Trump in Press Conference

East Room

12:55 P.M. EST

THE PRESIDENT: Thank you very much. I just wanted to begin by mentioning that the nominee for Secretary of the Department of Labor will be Mr. Alex Acosta. He has a law degree from Harvard Law School, was a great student. Former clerk for Justice Samuel Alito. And he has had a tremendous career. He's a member, and has been a member, of the National Labor Relations Board, and has been through Senate confirmation three times, confirmed -- did very, very well. And so Alex, I've

wished him the best. We just spoke. And he's going to be -- I think he'll be a tremendous Secretary of Labor.

And also, as you probably heard just a little while ago, Mick Mulvaney, former congressman, has just been approved -- weeks late, I have to say that. Weeks, weeks late. Office of Management and Budget. And he will be, I think, a fantastic addition. Paul Singer has just left. As you know, Paul was very much involved with the anti-Trump, or, as they say, "Never Trump." And Paul just left and he's given us his total support. And it's all about unification. We're unifying the party, and hopefully we're going to be able to unify the country. It's very important to me. I've been talking about that for a long time, but it's very, very important to me. So I want to thank Paul Singer for being here and for coming up to the office. He was a very strong opponent, and now he's a very strong ally. And I appreciate that.

I think I'll say a few words, and then we'll take some questions. And I had this time -- we've been negotiating a lot of different transactions to save money on contracts that were terrible, including airplane contracts that were out of control and late and terrible. Just absolutely catastrophic in terms of what was happening. And we've done some really good work. We're very proud of that.

And then right after that, you prepare yourselves and we'll do some questions -- unless you have no questions. That's always a possibility.

I'm here today to update the American people on the incredible progress that has been made in the last four weeks since my inauguration. We have made incredible progress. I don't think there's ever been a President elected who, in this short period of time, has done what we've done.

A new Rasmussen poll, in fact -- because the people get it; much of the media doesn't get it. They actually get it, but they don't write it -- let's put it that way. But a new Rasmussen poll just came out just a very short while ago, and it has our approval rating at 55 percent and going up. The stock market has hit record numbers, as you know. And there has been a tremendous surge of optimism in the business world, which is -- to me means something much different than it used to. It used to mean, oh, that's good. Now it means that's good for jobs. Very different. Plants and factories are already starting to move back into the United States and big league -- Ford, General Motors, so many of them.

I'm making this presentation directly to the American people with the media present, which is an honor to have you this morning, because many of our nation's

reporters and folks will not tell you the truth and will not treat the wonderful people of our country with the respect that they deserve. And I hope going forward we can be a little bit different, and maybe get along a little bit better, if that's possible. Maybe it's not, and that's okay too.

Unfortunately, much of the media in Washington, D.C., along with New York, Los Angeles, in particular, speaks not for the people but for the special interests and for those profiting off a very, very obviously broken system. The press has become so dishonest that if we don't talk about it, we are doing a tremendous disservice to the American people -- tremendous disservice. We have to talk about it to find out what's going on, because the press honestly is out of control. The level of dishonesty is out of control.

I ran for President to represent the citizens of our country. I am here to change the broken system so it serves their families and their communities well. I am talking, and really talking, on this very entrenched power structure, and what we're doing is we're talking about the power structure, we're talking about its entrenchment. As a result, the media is going through what they have to go through to oftentimes distort -- not all the time -- and some of the media is fantastic, I have to say; they're honest and fantastic. But much of it is not -- the distortion. And we'll talk about it, and you'll be able to ask me questions about it.

But we're not going to let it happen, because I'm here again to take my message straight to the people. As you know, our administration inherited many problems across government and across the economy. To be honest, I inherited a mess -- it's a mess -- at home and abroad. A mess. Jobs are pouring out of the country. You see what's going on with all of the companies leaving our country, going to Mexico and other places -- low-pay, low-wages. Mass instability overseas, no matter where you look. The Middle East, a disaster. North Korea -- we'll take care of it, folks. We're going to take care of it all. I just want to let you know I inherited a mess.

Beginning on day one, our administration went to work to tackle these challenges. On foreign affairs, we've already begun enormously productive talks with many foreign leaders -- much of it you've covered -- to move forward toward stability, security, and peace in the most troubled regions of the world, which there are many.

We've had great conversations with the United Kingdom -- and meetings -- Israel, Mexico, Japan, China, and Canada. Really, really productive conversations. I would

say far more productive than you would understand. We've even developed a new council with Canada to promote women's business leaders and entrepreneurs. It's very important to me, very important to my daughter Ivanka.

I have directed our defense community, headed by our great general, now Secretary Mattis -- he's over there now, working very hard -- to submit a plan for the defeat of ISIS, a group that celebrates the murder and torture of innocent people in large sections of the world. It used to be a small group, and now it's in large sections of the world. They've spread like cancer. ISIS has spread like cancer. Another mess I inherited.

And we have imposed new sanctions on the nation of Iran, who's totally taken advantage of our previous administration. And they're the world's top sponsor of terrorism. And we're not going to stop until that problem is properly solved. And it's not properly solved now. It's one of the worst agreements I've ever seen drawn by anybody.

I've ordered plans to begin for the massive rebuilding of the United States military. I've had great support from the Senate. I've had great support from Congress generally. We've pursued this rebuilding in the hopes that we will never have to use this military. And I will tell you that is my -- I would be so happy if we never had to use it. But our country will never have had a military like the military we're about to build and rebuild. We have the greatest people on Earth in our military, but they don't have the right equipment. And their equipment is old. I used it, I talked about it at every stop. Depleted -- it's depleted. It won't be depleted for long.

And I think one of the reasons I'm standing here instead of other people is that, frankly, I talked about we have to have a strong military. We have to have strong law enforcement also. So we do not go abroad in the search of war. We really are searching for peace, but it's peace through strength.

At home, we have begun the monumental task of returning the government back to the people on a scale not seen in many, many years. In each of these actions, I'm keeping my promises to the American people. These are campaign promises. Some people are so surprised that we're having strong borders. Well, that's what I've been talking about for a year and a half -- strong borders. They're so surprised -- "oh, you're having strong borders." Well, that's what I've been talking about to the press and to everybody else.

One promise after another after years of politicians lying to you to get elected.

They lie to the American people in order to get elected. Some of the things I'm doing probably aren't popular, but they're necessary for security and for other reasons. And then coming to Washington and pursuing their own interests, which is more important to many politicians.

I'm here following through on what I pledged to do. That's all I'm doing. I put it out before the American people. Got 306 Electoral College votes. I wasn't supposed to get 222. They said there's no way to get 222; 230 is impossible. Two hundred and seventy, which you need, that was laughable. We got 306 because people came out and voted like they've never seen before. So that's the way it goes. I guess it was the biggest Electoral College win since Ronald Reagan.

In other words, the media is trying to attack our administration because they know we are following through on pledges that we made, and they're not happy about it for whatever reason. But a lot of people are happy about it. In fact, I'll be in Melbourne, Florida, five o'clock on Saturday, and I heard -- just heard that the crowds are massive that want to be there.

I turn on the TV, open the newspapers, and I see stories of chaos. Chaos! Yet, it is the exact opposite. This administration is running like a fine-tuned machine, despite the fact that I can't get my Cabinet approved, and they're outstanding people. Like Senator Dan Coates whose there -- one of the most respected men of the Senate -- he can't get approved. How do you not approve him? He's been a colleague, highly respected -- brilliant guy, great guy, everybody knows it -- but waiting for approval.

So we have a wonderful group of people that's working very hard, that's being very much misrepresented about, and we can't let that happen. So if the Democrats, who have -- all you have to do is look at where they are right now -- the only thing they can do is delay, because they've screwed things up royally, believe me.

Let me list to you some of the things that we've done in just a short period of time. I just got here. I got here with no Cabinet. Again, each of these actions is a promise I made to the American people. So we'll go over just some of them, and we have a lot happening next week and in the weeks coming. We've withdrawn from the job-killing disaster known as Trans-Pacific Partnership. We're going to make trade deals, but we're going to have one-on-one deals -- bilateral. We're going to have one-on-one deals.

We've directed the elimination of regulations that undermine manufacturing, and called for expedited approval of the permits needed for America and American infrastructure, and that means plants, equipment, roads, bridges, factories. People take 10, 15, 20 years to get disapproved for a factory. They go in for a permit -- it's many, many years. And then at the end of the process -- they spend tens of millions of dollars on nonsense -- and at the end of the process, they get rejected. Now, they may be rejected with me, but it's going to be a quick rejection. It's not going to take years. But mostly, it's going to be an acceptance. We want plants built, and we want factories built, and we want the jobs. We don't want the jobs going to other countries.

We've imposed a hiring freeze on nonessential federal workers. We've imposed a temporary moratorium on new federal regulations. We've issued a game-changing new rule that says for each one new regulation, two old regulations must be eliminated. Makes sense. Nobody has ever seen regulations like we have. If you go to other countries and you look at industries they have, and you say, let me see your regulations, and they're a fraction, just a tiny fraction of what we have. And I want regulations because I want safety, I want all environmental situations to be taken properly care of. It's very important to me. But you don't need four or five or six regulations to take care of the same thing.

We've stood up for the men and women of law enforcement, directing federal agencies to ensure they are protected from crimes of violence. We've directed the creation of a task force for reducing violent crime in America, including the horrendous situation -- take a look at Chicago and others -- taking place right now in our inner cities. Horrible. We've ordered the Department of Homeland Security and Justice to coordinate on a plan to destroy criminal cartels coming into the United States with drugs. We're becoming a drug-infested nation. Drugs are becoming cheaper than candy bars, and we're not going to let it happen any longer.

We've undertaken the most substantial border security measures in a generation to keep our nation and our tax dollars safe, and are now in the process of beginning to build a promised wall on the southern border. Met with General, now Secretary, Kelly yesterday and we're starting that process. And the wall is going to be a great wall, and it's going to be a wall negotiated by me. The price is going to come down, just like it has on everything else I've negotiated for the government. And we're going to have a wall that works. We're not going to have a wall like they have now, which is either nonexistent or a joke.

We've ordered a crackdown on sanctuary cities that refuse to comply with federal law and that harbor criminal aliens, and we've ordered an end to the policy of catch and release on the border. No more release, no matter who you are -- release.

We've begun a nationwide effort to remove criminal aliens, gang members, drug dealers, and others who pose a threat to public safety. We are saving American lives every single day. The court system has not made it easy for us. And we've even created a new office in Homeland Security dedicated to the forgotten American victims of illegal immigrant violence, of which there are many.

We've taken decisive action to keep radical Islamic terrorists out of our country.

Though parts of our necessary and constitutional actions were blocked by a judge's, in my opinion, incorrect and unsafe ruling, our administration is working night and day to keep you safe -- including reporters safe -- and is vigorously defending this lawful order. I will not back down from defending our country. I got elected on defense of our country. And I keep my campaign promises. And our citizens will be very happy when they see the result. They already are. I can tell you that.

Extreme vetting will be put in place, and it already is in place in many places. In fact, we had to go quicker than we thought because of the bad decision we received from a circuit that has been overturned at a record number. I've heard 80 percent -- I find that hard to believe; that's just a number I heard -- that they're overturned 80 percent of the time. I think that circuit is in chaos and that circuit is, frankly, in turmoil. But we are appealing that and we are going further.

We're issuing a new executive action next week that will comprehensively protect our country, so we'll be going along the one path and hopefully winning that. At the same time, we will be issuing a new and very comprehensive order to protect our people, and that will be done some time next week, toward the beginning or middle at the latest part.

We've also taken steps to begin construction of the Keystone Pipeline and Dakota Access Pipelines -- thousands and thousands of jobs -- and put new "Buy American" measures in place to require American steel for American pipelines. In other words, they build a pipeline in this country and we use the powers of government to make that pipeline happen. We want them to use American steel. And they're willing to do that, but nobody ever asked before I came along. Even this order was drawn and they didn't say that. And I'm reading the order, I'm saying, why aren't we using American steel? And they said, that's a good idea. We put it in.

To drain the swamp of corruption in Washington, D.C. I've started by imposing a five-year lobbying ban on White House officials and a lifetime ban on lobbying for a foreign government. We've begun preparing to repeal and replace Obamacare. Obamacare is a disaster, folks. It's a disaster. You can say, oh, Obamacare -- I mean, they fill up our alleys with people that you wonder how they get there, but they're not the Republican people that our representatives are representing. So we've begun preparing to repeal and replace Obamacare and are deep in the midst of negotiations on a very historic tax reform to bring our jobs back. We're bringing our jobs back to this country big league. It's already happening, but big league.

I've also worked to install a Cabinet over the delays and obstruction of Senate Democrats. You've seen what they've done over the last long number of years. That will be one of the great Cabinets ever assembled in American history. You look at Rex Tillerson -- he's out there negotiating right now. General Mattis I mentioned before, General Kelly. We have great, great people. Mick is with us now. We have great people.

Among their responsibilities will be ending the bleeding of jobs from our country and negotiating fair trade deals for our citizens. Now, look, fair trade -- not free -- fair. If a country is taking advantage of us, we're not going to let that happen anymore. Every country takes advantage of us, almost. I may be able to find a couple that don't. But for the most part, that would be a very tough job for me to do.

Jobs have already started to surge. Since my election, Ford announced it will abandon its plans to build a new factory in Mexico and will instead invest \$700 million in Michigan, creating many, many jobs. Fiat-Chrysler announced it will invest \$1 billion in Ohio and Michigan, creating 2,000 new American jobs. They were with me a week ago. You know -- you were here. General Motors, likewise, committed to invest billions of dollars in its American manufacturing operation, keeping many jobs here that were going to leave. And if I didn't get elected, believe me, they would have left. And these jobs and these things that I'm announcing would never have come here.

Intel just announced that it will move ahead with a new plant in Arizona that probably was never going to move ahead with. And that will result in at least 10,000 American jobs. Walmart announced it will create 10,000 jobs in the United States just this year because of our various plans and initiatives. There will be many, many more. Many more. These are a few that we're naming.

Other countries have been taking advantage of us for decades -- decades and decades and decades, folks. And we're not going to let that happen anymore. Not going to let it happen.

And one more thing. I have kept my promise to the American people by nominating a justice of the United States Supreme Court, Judge Neil Gorsuch, who is from my list of 20, and who will be a true defender of our laws and our Constitution -- highly respected, should get the votes from the Democrats -- you may not see that, but he'll get there one way or the other. But he should get there the old-fashioned way, and he should get those votes.

This last month has represented an unprecedented degree of action on behalf of the great citizens of our country. Again, I say it -- there has never been a presidency that's done so much in such a short period of time. And we haven't even started the big work that starts early next week. Some very big things are going to be announced next week.

So we're just getting started. We will be giving a speech, as I said, in Melbourne, Florida, at 5:00 p.m. I hope to see you there. And with that, I'd just say, God bless America, and let's take some questions.

Mara. Mara, go ahead. You were cut off pretty violently at our last news conference.

Q Did you fire Mike Flynn?

THE PRESIDENT: Mike Flynn is a fine person, and I asked for his resignation. He respectfully gave it. He is a man who -- there was a certain amount of information given to Vice President Pence, who is with us today. And I was not happy with the way that information was given.

He didn't have to do that, because what he did wasn't wrong, what he did in terms of the information he saw. What was wrong was the way that other people, including yourselves in this room, were given that information, because that was classified information that was given illegally. That's the real problem. And you can talk all you want about Russia, which was all a fake news, fabricated deal to try and make up for the loss of the Democrats, and the press plays right into it. In fact, I saw a couple of the people that were supposedly involved with all of this -- they know nothing about it. They weren't in Russia, they never made a phone call to Russia, they never received a phone call. It's all fake news. It's all fake news.

The nice thing is I see it starting to turn, where people are now looking at the illegal, Mara -- and I think it's very important -- the illegal giving out classified information. And let me just tell you, it was given out, like, so much. I'll give you an example. I called, as you know, Mexico. It was a very confidential, classified call, but I called Mexico. And in calling Mexico, I figured, oh, well, that's -- I spoke to the President of Mexico, had a good call. All of a sudden it's out for the world to see. It's supposed to be secret. It's supposed to be either confidential or classified in that case. Same thing with Australia. All of a sudden people are finding out exactly what took place.

The same thing happened with respect to General Flynn. Everybody saw this, and I'm saying -- the first thing I thought of when I heard about it is, how does the press get this information that's classified? How do they do it? You know why? Because it's an illegal process, and the press should be ashamed of themselves. But, more importantly, the people that gave out the information to the press should be ashamed of themselves. Really ashamed.

Yes, go ahead.

Q Why did you keep your Vice President in the dark for almost two weeks?

THE PRESIDENT: Because when I looked at the information, I said, I don't think he did anything wrong. If anything, he did something right. He was coming into office, he looked at the information. He said, huh, that's fine, that's what they're supposed to do. They're supposed to be -- and he didn't just call Russia. He called and spoke to, both ways -- I think there were 30-some-odd countries. He's doing the job.

You know, he was just doing his job. The thing is he didn't tell our Vice President properly, and then he said he didn't remember. So either way, it wasn't very satisfactory to me. And I have somebody that I think will be outstanding for the position, and that also helps, I think, in the making of my decision.

But he didn't tell the Vice President of the United States the facts, and then he didn't remember. And that just wasn't acceptable to me.

Yes.

Q President Trump, since you brought up Russia, I'm looking for some clarification here. During the campaign, did anyone from your team communicate with

members of the Russian government or Russian intelligence? And if so, what was the nature of those conversations?

THE PRESIDENT: Well, the failing New York Times wrote a big, long front-page story yesterday. And it was very much discredited, as you know. It was -- it's a joke. And the people mentioned in the story -- I notice they were on television today saying they never even spoke to Russia. They weren't even a part, really -- I mean, they were such a minor part -- I hadn't spoken to them. I think the one person, I don't think I've ever spoken to him. I don't think I've ever met him. And he actually said he was a very low-level member of, I think, a committee for a short period of time. I don't think I ever met him. Now, it's possible that I walked into a room and he was sitting there, but I don't think I ever met him. I didn't talk to him, ever. And he thought it was a joke.

The other person said he never spoke to Russia, never received a call. Look at his phone records, et cetera, et cetera. And the other person, people knew that he'd represented various countries, but I don't think he represented Russia -- but knew that he represented various countries. That's what he does. I mean, people know that. That's Mr. Manafort, who's, by the way -- who's, by the way, a respected man. He's a respected man. But I think he represented the Ukraine, or Ukraine government, or somebody. But everybody -- people knew that. Everybody knew that. So these people -- and he said that he has absolutely nothing to do and never has with Russia. And he said that very forcefully. I saw his statement. He said it very forcefully. Most of the papers don't print it because that's not good for their stories.

So the three people that they talked about all totally deny it. And I can tell you, speaking for myself, I own nothing in Russia. I have no loans in Russia. I don't have any deals in Russia. President Putin called me up very nicely to congratulate me on the win of the election. He then called me up extremely nicely to congratulate me on the inauguration, which was terrific. But so did many other leaders -- almost all other leaders from almost all other countries. So that's the extent.

Russia is fake news. Russia -- this is fake news put out by the media. The real news is the fact that people, probably from the Obama administration because they're there -- because we have our new people going in place right now. As you know, Mike Pompeo is now taking control of the CIA. James Comey at FBI. Dan Coats is waiting to be approved. I mean, he is a senator, and a highly respected one. And he's still waiting to be approved. But our new people are going in.

And just while you're at, because you mentioned this, Wall Street Journal did a story today that was almost as disgraceful as the failing New Times's story yesterday. And it talked about -- you saw it, front page. So, Director of National Intelligence just put out -- acting -- a statement: "Any suggestion that the United States intelligence community" -- this was just given to us -- "is withholding information and not providing the best possible intelligence to the President and his national security team is not true."

So they took this front-page story out of The Wall Street Journal -- top -- and they just wrote the story is not true. And I'll tell you something, I'll be honest -- because I sort of enjoy this back and forth, and I guess I have all my life, but I've never seen more dishonest media than, frankly, the political media. I thought the financial media was much better, much more honest. But I will say that I never get phone calls from the media. How do they write a story like that in The Wall Street Journal without asking me? Or how do they write a story in The New York Times, put it on front page? That was like that story they wrote about the women and me -- front page. Big massive story. And it was nasty.

And then they called. They said, "We never said that. We like Mr. Trump." They called up my office -- we like Mr. Trump; we never said that. And it was totally -- they totally misrepresented those very wonderful women, I have to tell you -- totally misrepresented. I said, give us a retraction. They never gave us a retraction. And, frankly, I then went on to other things.

Go ahead.

Q Mr. President --

THE PRESIDENT: You okay?

Q I am. Just wanted to get untangled. Very simply, you said today that you had the biggest electoral margins since Ronald Reagan with 304 or 306 electoral votes. In fact, President Obama got 365 in 2008.

THE PRESIDENT: Well, I'm talking about Republican. Yes.

Q President Obama, 332. George H.W. Bush, 426 when he won as President. So why should Americans trust --

THE PRESIDENT: Well, no, I was told -- I was given that information. I don't know. I was just given. We had a very, very big margin.

Q I guess my question is, why should Americans trust you when you have accused the information they receive of being fake when you're providing information that's fake?

THE PRESIDENT: Well, I don't know. I was given that information. I was given -- actually, I've seen that information around. But it was a very substantial victory. Do you agree with that?

Q You're the President.

THE PRESIDENT: Okay, thank you. That's a good answer. Yes.

Q Mr. President, thank you so much. Can you tell us in determining that Lieutenant General Flynn -- there was no wrongdoing in your mind, what evidence was weighed? Did you have the transcripts of these telephone intercepts with Russian officials, particularly Ambassador Kislyak, who he was communicating with? What evidence did you weigh to determine there was no wrong doing?

And further than that, sir, you've said on a couple of occasions this morning that you were going to aggressively pursue the sources of these leaks.

THE PRESIDENT: We are.

Q Can we ask what you're doing to do? And also, we've heard about a review of the intelligence community headed by Stephen Feinberg. What can you tell us about that?

THE PRESIDENT: Well, first of all, about that, we now have Dan Coats, hopefully soon Mike Pompeo and James Comey, and they're in position. So I hope that we'll be able to straighten that out without using anybody else. The gentleman you mentioned is a very talented man, very successful man. And he has offered his services, and it's something we may take advantage of. But I don't think we'll need that at all because of the fact that I think that we're going to be able to straighten it out very easily on its own.

As far as the general is concerned, when I first heard about it, I said, huh, that doesn't sound wrong. My counsel came -- Don McGahn, White House Counsel -- and he told me, and I asked him, and he can speak very well for himself. He said he doesn't think anything is wrong. He really didn't think -- it was really what happened after that, but he didn't think anything was done wrong. I didn't either,

because I waited a period of time and I started to think about it. I said, well, I don't see -- to me, he was doing the job.

The information was provided by -- who I don't know -- Sally Yates -- and I was a little surprised because I said, doesn't sound like he did anything wrong there. But he did something wrong with respect to the Vice President, and I thought that was not acceptable. As far as the actual making the call -- in fact, I've watched various programs and I've read various articles where he was just doing his job. That was very normal. At first, everybody got excited because they thought he did something wrong. After they thought about it, it turned out he was just doing his job.

So -- and I do -- and, by the way, with all of that being said, I do think he's a fine man.

Yes, Jon.

Q On the leaks, sir --

THE PRESIDENT: Go ahead, finish off, then I'll get you, Jon.

Q Sorry, what will you do on the leaks? You have said twice today --

THE PRESIDENT: Yes, we're looking at it very, very seriously. I've gone to all of the folks in charge of the various agencies, and we're -- I've actually called the Justice Department to look into the leaks. Those are criminal leaks. They're put out by people either in agencies. I think you'll see it stopping because now we have our people in. You know, again, we don't have our people in because we can't get them approved by the Senate. We just had Jeff Sessions approved in Justice, as an example. So we are looking into that very seriously. It's a criminal act.

You know what I say -- when I was called out on Mexico, I was shocked. Because all this equipment, all this incredible phone equipment. When I was called out on Mexico, I was -- honestly, I was really, really surprised. But I said, you know, it doesn't make sense, that won't happen. But that wasn't that important to call, it was fine. I could show it to the world and he could show it to the world -- the President who is a very fine man, by the way. Same thing with Australia. I said, that's terrible that it was leaked but it wasn't that important. But then I said, what happens when I'm dealing with the problem of North Korea? What happens when I'm dealing with the problems in the Middle East? Are you folks going to be

reporting all of that very, very confidential information -- very important, very -- I mean, at the highest level, are you going to be reporting about that too?

So I don't want classified information getting out to the public. And in a way, that was almost a test. So I'm dealing with Mexico. I'm dealing with Argentina. We were dealing on this case with Mike Flynn. All this information gets put into the Washington Post and gets put into the New York Times. And I'm saying, what's going to happen when I'm dealing on the Middle East? What's going to happen when I'm dealing with really, really important subjects like North Korea? We've got to stop it. That's why it's a criminal penalty.

Yes, Jon.

Q Thank you, Mr. President. I just want to get you to clarify just a very important point. Can you say definitively that nobody on your campaign had any contacts with the Russians during the campaign? And, on the leaks, is it fake news or are these real leaks?

THE PRESIDENT: Well, the leaks are real. You're the one that wrote about them and reported them. I mean, the leaks are real. You know what they said -- you saw it. And the leaks are absolutely real. The news is fake because so much of the news is fake.

So one thing that I felt it was very important to do -- and I hope we can correct it, because there is nobody I have more respect for -- well, maybe a little bit -- than reporters, than good reporters. It's very important to me, and especially in this position. It's very important. I don't mind bad stories. I can handle a bad story better than anybody as long as it's true. And over a course of time, I'll make mistakes and you'll write badly and I'm okay with that. But I'm not okay when it is fake. I mean, I watch CNN -- it's so much anger and hatred and just the hatred. I don't watch it anymore because it's very good -- he's saying no. It's okay, Jim. It's okay, Jim. You'll have your chance. But I watch others too. You're not the only one, so don't feel badly.

But I think it should be straight. I think it should be -- I think it would be, frankly, more interesting. I know how good everybody's ratings are right now, but I think that actually would be -- I think that it would actually be better.

People -- I mean, you have a lower approval rate than Congress. I think that's right. I don't know, Peter, is that one right? Because you know, I think they have lower -- I heard, lower than Congress.

But honestly, the public would appreciate it. I'd appreciate it. Again, I don't mind bad stories when it's true. But we have an administration where the Democrats are making it very difficult. I think we're setting a record, or close to a record in the time of approval of a Cabinet. I mean, the numbers are crazy. When I'm looking -- some of them had them approved immediately. I'm going forever, and I still have a lot of people that we're waiting for.

And that's all they're doing, is delaying. And you look at Schumer and the mess that he's got over there, and they have nothing going. The only thing they can do is delay. And you know, I think they'd be better served by approving and making sure that they're happy and everybody is good. And sometimes, I mean -- I know President Obama lost three or four, and you lose them on the way. And that's okay. That's fine.

But I think they would be much better served, Jon, if they just went through the process quickly. This is pure delay tactics. And they say it, and everybody understands it.

Yeah, go ahead, Jim.

Q The first part of my question on contacts. Do you definitively say that nobody --

THE PRESIDENT: Well, I had nothing to do with it. I have nothing to do with Russia. I told you, I have no deals there. I have no anything.

Now, when WikiLeaks, which I had nothing to do with, comes out and happens to give -- they're not giving classified information. They're giving stuff -- what was said at an office about Hillary cheating on the debates -- which, by the way, nobody mentions. Nobody mentions that Hillary received the questions to the debates.

Can you imagine -- seriously, can you imagine if I received the questions? It would be the electric chair, okay? "He should be put in the electric chair." You would even call for the reinstitution of the death penalty, okay? Maybe not you, Jon.

Yes, we'll do you next, Jim. I'll do you next. Yes?

Q Thank you, Mr. President. I just want to clarify one other thing.

THE PRESIDENT: Sure.

Q Did you direct Mike Flynn to discuss the sanctions with the Russian ambassador?

THE PRESIDENT: No, I didn't. No, I didn't.

Q (Inaudible.) (Off mic.)

THE PRESIDENT: No, I didn't.

Q Did you fire him because (inaudible) --

THE PRESIDENT: Excuse me -- no, I fired him because of what he said to Mike Pence, very simple. Mike was doing his job. He was calling countries and his counterparts. So it certainly would have been okay with me if he did it. I would have directed him to do it if I thought he wasn't doing it. I didn't direct him but I would have directed him because that's his job.

And it came out that way -- and, in all fairness, I watched Dr. Charles Krauthammer the other night say he was doing his job. And I agreed with him. And since then I've watched many other people say that.

No, I didn't direct him, but I would have directed him if he didn't do it, okay?

Jim.

Q Mr. President, thank you very much. And just for the record, we don't hate you, I don't hate you. If you could pass that along.

THE PRESIDENT: Okay. Well, ask Jeff Zucker how he got his job, okay?

Q If I may follow up on some of the questions that have taken place so far, sir.

THE PRESIDENT: Well, not too many. We do have other people. You do have other people, and your ratings aren't as good as some of the other people that are waiting.

Q They're pretty good right now, actually.

THE PRESIDENT: Okay. Go ahead, Jim.

Q If I may ask, sir, you said earlier that WikiLeaks was revealing information about the Hillary Clinton campaign during the election cycle. You welcomed that at one point.

THE PRESIDENT: I was okay with it.

Q You said you loved WikiLeaks. At another campaign press conference you called on the Russians to find the missing 30,000 emails. I'm wondering, sir, if you --

THE PRESIDENT: Well, she was actually missing 33,000, and then that got extended with a whole pile after that, but that's okay.

Q Maybe my numbers are off a little bit too.

THE PRESIDENT: No, no, but I did say 30,000, but it was actually higher than that.

Q If I may ask you, sir, it sounds as though you do not have much credibility here when it comes to leaking if that is something that you encouraged in the campaign.

THE PRESIDENT: Okay, fair question. Ready?

Q So if I may ask you that -- if I may ask a follow-up --

THE PRESIDENT: No, no, but are you -- let me do one at a time. Do you mind?

Q Yes, sir.

THE PRESIDENT: All right. So in one case you're talking about highly classified information. In the other case you're talking about John Podesta saying bad things about the boss. I will say this: If John Podesta said that about me and he was working for me, I would have fired him so fast your head would have spun. He said terrible things about her. But it wasn't classified information.

But in one case you're talking about classified. Regardless, if you look at the RNC, we had a very strong -- at my suggestion -- and I give Reince great credit for this -- at my suggestion, because I know something about this world, I said I want a very strong defensive mechanism. I don't want to be hacked. And we did that, and you have seen that they tried to hack us and they failed.

The DNC did not do that. And if they did it, they could not have been hacked. But they were hacked, and terrible things came. And the only thing that I do think is unfair is some of the things were so -- they were -- when I heard some of those

things, I said -- I picked up the papers the next morning, I said, oh, this is going to front page. It wasn't even in the papers.

Again, if I had that happen to me, it would be the biggest story in the history of publishing or the head of newspapers. I would have been the headline in every newspaper.

I mean, think of it. They gave her the questions for the debate, and she should have reported herself. Why didn't Hillary Clinton announce that, "I'm sorry, but I have been given the questions to a debate or a town hall, and I feel that it's inappropriate, and I want to turn in CNN for not doing a good job"?

Q And if I may follow up on that, just something that Jonathan Karl was asking you about -- you said that the leaks are real, but the news is fake. I guess I don't understand. It seems that there is a disconnect there. If the information coming from those leaks is real, then how can the stories be fake?

THE PRESIDENT: Well, the reporting is fake. Look, look --

Q And if I may ask -- I just want to ask one other question.

THE PRESIDENT: Jim, you know what it is? Here's the thing. The public isn't -- they read newspapers, they see television, they watch. They don't know if it's true or false because they're not involved. I'm involved. I've been involved with this stuff all my life. But I'm involved. So I know when you're telling the truth or when you're not.

I just see many, many untruthful things. And I tell you what else I see. I see tone. You know the word "tone." The tone is such hatred. I'm really not a bad person, by the way. No, but the tone is such -- I do get good ratings, you have to admit that. The tone is such hatred.

I watched this morning a couple of the networks, and I have to say "Fox & Friends" in the morning, they're very honorable people. They're very -- not because they're good, because they hit me also when I do something wrong. But they have the most honest morning show. That's all I can say. It's the most honest. But the tone, Jim. If you look -- the hatred. I mean, sometimes -- sometimes somebody gets --

Q (Off mic.)

THE PRESIDENT: Well, you look at your show that goes on at 10 o'clock in the evening. You just take a look at that show. That is a constant hit. The panel is almost always exclusive anti-Trump. The good news is he doesn't have good ratings. But the panel is almost exclusive anti-Trump. And the hatred and venom coming from his mouth, the hatred coming from other people on your network.

Now, I will say this. I watch it. I see it. I'm amazed by it. And I just think you'd be a lot better off -- I honestly do. The public gets it, you know. Look, when I go to rallies, they turn around, they start screaming at CNN. They want to throw their placards at CNN.

I think you would do much better by being different. But you just take a look. Take a look at some of your shows in the morning and the evening. If a guest comes out and says something positive about me, it's brutal.

Now, they'll take this news conference. I'm actually having a very good time, okay? But they'll take this news conference -- don't forget that's the way I won. Remember, I used to give you a news conference every time I made a speech, which was like every day.

Q (Off mic.)

THE PRESIDENT: No, that's how I won. I won with news conferences and probably speeches. I certainly didn't win by people listening to you people, that's for sure.

But I am having a good time. Tomorrow they will say, Donald Trump rants and raves at the press. I'm not ranting and raving. I'm just telling you, you're dishonest people. But -- but I'm not ranting and raving. I love this. I'm having a good time doing it. But tomorrow the headlines are going to be: Donald Trump Rants and Raves. I'm not ranting and raving.

Q If I may just --

THE PRESIDENT: Go ahead.

Q One more follow-up because --

THE PRESIDENT: Should I let him have a little bit more? What do you think, Peter?

Q Just because of this --

THE PRESIDENT: Peter, should I have let him have a little bit more? Sit down. Sit down.

Q Just because of the attack --

THE PRESIDENT: We'll get it.

Q Just because of the attack of fake news and attacking our network, I just want to ask you, sir --

THE PRESIDENT: I'm changing it from fake news, though.

Q Doesn't that undermine --

THE PRESIDENT: Very fake news now. (Laughter.)

Q But aren't you --

THE PRESIDENT: Yes, go ahead.

Q Real news, Mr. President. Real news.

THE PRESIDENT: And you're not related to our new --

Q I am not related, sir, no. (Laughter.) I do like the sound of Secretary Acosta, I must say.

THE PRESIDENT: I looked -- you know, I looked at that name. I said, wait a minute, is there any relation there? Alex Acosta.

Q I'm sure you checked that out, sir.

THE PRESIDENT: No, I checked it. I said -- they said, no, sir. I said, do me a favor, go back and check the family tree.

Q But aren't you concerned, sir, that you are undermining the people's faith in the First Amendment freedom of the press, the press in this country when you call stories you don't like "fake news"? Why not just say it's a story I don't like?

THE PRESIDENT: I do that.

Q When you call it fake news, you're undermining confidence --

THE PRESIDENT: No, I do that. No, no, I do that.

Q -- in our news media.

THE PRESIDENT: Here's the thing.

Q Isn't that important?

THE PRESIDENT: Okay, I understand -- and you're right about that except this. See, I know when I should get good and when I should get bad. And sometimes I'll say, wow, that's going to be a great story, and I'll get killed. I know what's good and bad. I'd be a pretty good reporter -- not as good as you. But I know what's good. I know what's bad.

And when they change it and make it really bad -- something that should be positive. Sometimes something that should be very positive, they'll make okay. They'll even make it negative. So I understand it because I'm there. I know what was said. I know who is saying it. I'm there. So it's very important to me.

Look, I want to see an honest press. When I started off today by saying that it's so important to the public to get an honest press. The press -- the public doesn't believe you people anymore. Now, maybe I had something to do with that, I don't know. But they don't believe you.

If you were straight and really told it like it is, as Howard Cosell used to say, right? Of course, he had some questions also. But if you were straight, I would be your biggest booster, I would be your biggest fan in the world -- including bad stories about me. But if you go -- as an example, you're CNN -- I mean, it's story after story after story is bad. I won. I won. And the other thing: Chaos. There's zero chaos. We are running -- this is a fine-tuned machine. And Reince happens to be doing a good job. But half of his job is putting out lies by the press.

I said to him yesterday, this whole Russia scam that you guys are building so that you don't talk about the real subject, which is illegal leaks. But I watched him yesterday working so hard to try and get that story proper. And I'm saying, here's my Chief of Staff, a really good guy, did a phenomenal job at RNC. I mean, we won the election, right? We won the presidency. We got some senators. We got some -- all over the country, you take a look, he's done a great job.

And I said to myself, you know -- and I said to somebody that was in the room -- I said, you take a look at Reince, he's working so hard just putting out fires that are fake fires. They're fake. They're not true. And isn't that a shame, because he'd

rather be working on health care. He'd rather be working on tax reform, Jim. I mean that. I would be your biggest fan in the world if you treated me right. I sort of understand there's a certain bias, maybe by Jeff or somebody -- for whatever reason. And I understand that. But you've got to be at least a little bit fair. And that's why the public sees it -- they see it. They see it's not fair. You take a look at some of your shows and you see the bias and the hatred. And the public is smart. They understand it.

Okay, yeah, go ahead.

Q We have no doubt that your latest story is (inaudible). But for those who believe that there is something to it, is there anything that you have learned over these last few weeks that you might be able to reveal that might ease their concerns that this isn't fake news? And secondly --

THE PRESIDENT: I think they don't believe it. I don't think the public would. That's why the Rasmussen poll just has me through the roof. I don't think they believe it. Well, I guess one of the reasons I'm here today is to tell you the whole Russian thing -- that's a ruse. That's a ruse. And, by the way, it would be great if we could get along with Russia, just so you understand that. Now, tomorrow you'll say, Donald Trump wants to get along with Russia, this is terrible. It's not terrible -- it's good.

We had Hillary Clinton try and do a reset. We had Hillary Clinton give Russia 20 percent of the uranium in our country. You know what uranium is, right? It's this thing called nuclear weapons and other things. Like, lots of things are done with uranium, including some bad things. Nobody talks about that. I didn't do anything for Russia. I've done nothing for Russia. Hillary Clinton gave them 20 percent of our uranium. Hillary Clinton did a reset, remember, with the stupid plastic button that made us all look like a bunch of jerks? Here, take a look. He looked at her like, what the hell is she doing with that cheap plastic button? Hillary Clinton -- that was a reset. Remember? It said "reset."

Now, if I do that, oh, I'm a bad guy. If we could get along with Russia, that's a positive thing. We have a very talented man, Rex Tillerson, who is going to be meeting with them shortly. And I told him, I said, I know politically it's probably not good for me. Hey, the greatest thing I could do is shoot that ship that's 30 miles offshore right out of the water. Everyone in this country is going to say, oh, it's so great. That's not great. That's not great. I would love to be able to get along with Russia.

Now, you've had a lot of Presidents that haven't taken that tact. Look where we are now. Look where we are now. So, if I can -- now, I love to negotiate things. I do it really well and all that stuff, but it's possible I won't be able to get along with Putin. Maybe it is. But I want to just tell you, the false reporting by the media, by you people -- the false, horrible, fake reporting makes it much harder to make a deal with Russia. And probably Putin said, you know -- he's sitting behind his desk and he's saying, you know, I see what's going on in the United States, I follow it closely; it's got to be impossible for President Trump to ever get along with Russia because of all the pressure he's got with this fake story. Okay? And that's a shame. Because if we could get along with Russia -- and, by the way, China and Japan and everyone -- if we could get along, it would be a positive thing, not a negative thing.

Q Tax reform --

Q Mr. President, since you --

THE PRESIDENT: Tax reform is going to happen fairly quickly. We're doing Obamacare -- we're in final stages. We should be submitting the initial plan in March, early March, I would say. And we have to, as you know, statutorily and for reasons of budget, we have to go first. It's not like -- frankly, the tax would be easier, in my opinion, but for statutory reasons and for budgetary reasons, we have to submit the health care sooner. So we'll be submitting health care sometime in early March, mid-March. And after that, we're going to come up -- and we're doing very well on tax reform.

Yes.

Q Mr. President, you mentioned Russia. Let's talk about some serious issues that have come up in the last week that you have had to deal with as President of the United States.

THE PRESIDENT: Okay.

Q You mentioned the vessel, the spy vessel, off the coast of the United States.

THE PRESIDENT: Not good.

Q There was a ballistic missile test that many interpreted as a violation --

THE PRESIDENT: Not good.

Q -- of the agreement between the two countries. And a Russian plane buzzed a U.S. destroyer.

THE PRESIDENT: Not good.

Q I listened to you during the campaign --

THE PRESIDENT: Excuse me, excuse me, when did it happen? It happened when -- if you were Putin right now, you would say, hey, we're back to the old games with the United States. There's no way Trump can ever do a deal with us because the -- you have to understand, if I was just brutal on Russia right now, just brutal, people would say, you would say, oh, isn't that wonderful. But I know you well enough. Then you would say, oh, he was too tough, he shouldn't have done that. Look, of all --

Q I'm just trying to find out your orientation to those --

THE PRESIDENT: Wait a minute. Wait, wait. Excuse me just one second.

Q I'm just trying to find out what you're doing to do about them, Mr. President.

THE PRESIDENT: All of those things that you mentioned are very recent, because probably Putin assumes that he's not going to be able to make a deal with me because it's politically not popular for me to make a deal. So Hillary Clinton tries to reset, it failed. They all tried. But I'm different than those people.

Go ahead.

Q How are you interpreting those moves? And what do you intend to do about them?

THE PRESIDENT: Just the way I said it.

Q Have you given Rex Tillerson any advice or counsel on how to deal?

THE PRESIDENT: I have. I have. And I'm so beautifully represented. I'm so honored that the Senate approved him. He's going to be fantastic.

Yes, I think that I've already --

Q Is Putin testing you, do you believe, sir?

THE PRESIDENT: No, I don't think so. I think Putin probably assumes that he can't make a deal with me anymore because politically it would be unpopular for a politician to make a deal. I can't believe I'm saying I'm a politician, but I guess that's what I am now. Because, look, it would be much easier for me to be tough on Russia, but then we're not going to make a deal.

Now, I don't know that we're going to make a deal. I don't know. We might, we might not. But it would be much easier for me to be so tough -- the tougher I am on Russia, the better. But you know what, I want to do the right thing for the American people. And to be honest, secondarily, I want to do the right thing for the world.

If Russia and the United States actually got together and got along -- and don't forget, we're a very powerful nuclear country and so are they. There's no upside. We're a very powerful nuclear country and so are they. I've been briefed. And I can tell you, one thing about a briefing that we're allowed to say because anybody that ever read the most basic book can say it: Nuclear holocaust would be like no other. They're a very powerful nuclear country and so are we.

If we have a good relationship with Russia, believe me, that's a good thing, not a bad thing.

Q So when you say they're not good, do you mean that they are --

THE PRESIDENT: Who did I say is not good?

Q No, when I read off the three things that have recently happened and each one of them you said they're not good.

THE PRESIDENT: No, it's not good, but they happened.

Q But do they damage the relationship? Do they undermine this country's ability to work with Russia?

THE PRESIDENT: They all happened recently, and I understand what they're doing, because they're doing the same thing. Now, again, maybe I'm not going to be able to do a deal with Russia, but at least I will have tried. And if I don't, does anybody really think that Hillary Clinton would be tougher on Russia than Donald Trump? Does anybody in this room really believe that? Okay.

But I tell you one thing: She tried to make a deal. She had the reset. She gave all the valuable uranium away. She did other things. You know, they say I'm close to

Russia. Hillary Clinton gave away 20 percent of the uranium in the United States. She's close to Russia. I gave -- you know what I gave to Russia? You know what I gave? Nothing.

Q Can we conclude there will be no response to these particular provocations?

THE PRESIDENT: I'm not going to tell you anything about what response I do. I don't talk about military response. I don't say I'm going into Mosul in four months. "We are going to attack Mosul in four months." Then three months later: "We are going to attack Mosul in one month." "Next week, we are going to attack Mosul." In the meantime, Mosul is very, very difficult. Do you know why? Because I don't talk about military, and I don't talk about certain other things. You're going to be surprised to hear that. And, by the way, my whole campaign, I'd say that. So I don't have to tell you --

Q There will be a response?

THE PRESIDENT: I don't want to be one of these guys that say, "Yes, here's what we're going to do." I don't have to do that.

Q There will be a -- in other words, there will be a response, Mr. President?

THE PRESIDENT: I don't have to tell you what I'm going to do in North Korea. Wait a minute. I don't have to tell you what I'm going to do in North Korea. And I don't have to tell you what I'm going to do with Iran. You know why? Because they shouldn't know. And eventually you guys are going to get tired of asking that question. So when you ask me, what am I going to do with the ship -- the Russian ship, as an example -- I'm not going to tell you. But hopefully, I won't have to do anything. But I'm not going to tell you. Okay.

Q Thanks.

Q Can I just ask you -- thank you very much, Mr. President -- the Trump --

THE PRESIDENT: Where are you from?

Q BBC.

THE PRESIDENT: Okay. Here's another beauty.

Q That's a good line. Impartial, free, and fair.

THE PRESIDENT: Yeah, sure.

Q Mr. President --

THE PRESIDENT: Just like CNN, right?

Q Mr. President, on the travel ban -- we could banter back and forth. On the travel ban, would you accept that that was a good example of the smooth running of government, that fine-tuned --

THE PRESIDENT: Yeah, I do. I do. And let me tell you about the travel --

Q Were there any mistakes in that?

THE PRESIDENT: Wait, wait, wait. I know who you are. Just wait. Let me tell you about the travel ban. We had a very smooth rollout of the travel ban, but we had a bad court. We got a bad decision. We had a court that's been overturned -- again, maybe wrong, but I think it's 80 percent of the time. A lot. We had a bad decision. We're going to keep going with that decision. We're going to put in a new executive order next week sometime. But we had a bad decision. That's the only thing that was wrong with the travel ban.

You had Delta with a massive problem with their computer system at the airports. You had some people that were put out there, brought by very nice buses, and they were put out at various locations. Despite that, the only problem that we had is we had a bad court. We had a court that gave us what I consider to be, with great respect, a very bad decision. Very bad for the safety and security of our country. The rollout was perfect.

Now, what I wanted to do was do the exact same executive order but said one thing -- and I said this to my people: Give them a one-month period of time. But General Kelly, now Secretary Kelly, said, if you do that, all these people will come in, in the month -- the bad ones. You do agree, there are bad people out there, right? They're not everybody that's like you. You have some bad people out there.

So Kelly said, you can't do that. And he was right. As soon as he said it, I said, wow, never thought of it. I said, how about one week? He said, no good. You got to do it immediately, because if you do it immediately, they don't have time to come in. Now, nobody ever reports that, but that's why we did it quickly.

Now, if would have done it a month, everything would have been perfect. The problems is we would have wasted a lot of time, and maybe a lot of lives, because a lot of bad people would have come into our country.

Now, in the meantime, we've vetting very, very strongly. Very, very strongly. But we need help, and we need help by getting that executive order passed.

Q Just a brief follow-up. And if it's so urgent, why not introduce --

THE PRESIDENT: Yes, go ahead.

Q Thank you. I just was hoping that we could get a yes- or-no answer on one of these questions involving Russia. Can you say whether you are aware that anyone who advised your campaign had contacts with Russia during the course of the election?

THE PRESIDENT: Well, I told you, General Flynn obviously was dealing. So that's one person. But he was dealing -- as he should have been --

Q During the election?

THE PRESIDENT: No, no, nobody that I know of.

Q So you're not aware of any contacts during the course of the election?

THE PRESIDENT: Look, look, how many times do I have to answer this question?

Q Can you just say yes or no on it?

THE PRESIDENT: Russia is a ruse. Yeah, I know you have to get up and ask a question, so important. Russia is a ruse. I have nothing to do with Russia, haven't made a phone call to Russia in years. Don't speak to people from Russia. Not that I wouldn't, I just have nobody to speak to. I spoke to Putin twice. He called me on the election -- I told you this -- and he called me on the inauguration, and a few days ago. We had a very good talk, especially the second one -- lasted for a pretty long period of time. I'm sure you probably get it because it was classified, so I'm sure everybody in this room perhaps has it. But we had a very, very good talk. I have nothing to do with Russia. To the best of my knowledge, no person that I deal with does.

Now, Manafort has totally denied it. He denied it. Now, people knew that he was a consultant over in that part of the world for a while, but not for Russia. I think he

represented Ukraine or people having to do with Ukraine, or people that -- whoever. But people knew that. Everybody knew that.

Q But in his capacity as your campaign manager, was he in touch with Russian officials during the election?

THE PRESIDENT: I have -- you know what, he said no. I can only tell you what he -- now, he was replaced long before the election. You know that, right? He was replaced long before the election. When all of this stuff started coming out, it came out during the election. But Paul Manafort, who's a good man also, by the way -- Paul Manafort was replaced long before the election took place. He was only there for a short period of time.

How much longer should we stay here, folks? Five more minutes, is that okay? Five?

Q Mr. President, on national security --

THE PRESIDENT: Wait, let's see, who's -- I want to find a friendly reporter. Are you a friendly reporter? Watch how friendly he is. Wait, wait -- watch how friendly he is. Go ahead. Go ahead.

Q So, first of all, my name is (inaudible) from (inaudible) Magazine. And (inaudible). I haven't seen anybody in my community accuse either yourself or any of the -- anyone on your staff of being anti-Semitic. We have an understanding of (inaudible).

THE PRESIDENT: Thank you.

Q However, what we are concerned about, and what we haven't really heard be addressed is an uptick in anti-Semitism and how the government is planning to take care of it. There have been reports out that 48 bomb threats have been made against Jewish centers all across the country in the last couple of weeks. There are people who are committing anti-Semitic acts or threatening to --

THE PRESIDENT: You see, he said he was going to ask a very simple, easy question. And it's not. It's not. Not a simple question, not a fair question. Okay, sit down. I understand the rest of your question.

So here's the story, folks. Number one, I am the least anti-Semitic person that you've ever seen in your entire life. Number two, racism -- the least racist person. In fact, we did very well relative to other people running as a Republican.

Q (Inaudible.)

THE PRESIDENT: Quiet, quiet, quiet. See, he lied about -- he was going to get up and ask a very straight, simple question. So you know, welcome to the world of the media. But let me just tell you something -- that I hate the charge. I find it repulsive. I hate even the question because people that know me -- and you heard the Prime Minister, you heard Netanyahu yesterday -- did you hear him, Bibi? He said, I've known Donald Trump for a long time, and then he said, forget it.

So you should take that, instead of having to get up and ask a very insulting question like that.

Yeah, go ahead. Go ahead.

Q Thank you. I'm Lisa from the PBS --

THE PRESIDENT: See, it just shows you about the press, but that's the way the press is.

Q Thank you, Mr. President. Lisa Desjardins from the PBS Newshour.

THE PRESIDENT: Good.

Q On national security and immigration, can you give us more details on the executive order you planned for next week, even its broad outlines? Will it be focused on specific countries?

THE PRESIDENT: It's a very fair question.

Q And in addition, on the DACA program for immigration, what is your plan? Do you plan to continue that program or to end it?

THE PRESIDENT: We're going to show great heart. DACA is a very, very difficult subject for me, I will tell you. To me, it's one of the most difficult subjects I have, because you have these incredible kids, in many cases -- not in all cases. In some of the cases they're having DACA and they're gang members and they're drug dealers too. But you have some absolutely incredible kids -- I would say mostly -- they were brought here in such a way -- it's a very, very tough subject.

We are going to deal with DACA with heart. I have to deal with a lot of politicians, don't forget, and I have to convince them that what I'm saying is right. And I appreciate your understanding on that.

But the DACA situation is a very, very -- it's a very difficult thing for me. Because, you know, I love these kids. I love kids. I have kids and grandkids. And I find it very, very hard doing what the law says exactly to do. And you know, the law is rough. I'm not talking about new laws. I'm talking the existing law is very rough. It's very, very rough.

As far as the new order, the new order is going to be very much tailored to what I consider to be a very bad decision, but we can tailor the order to that decision and get just about everything, in some ways more. But we're tailoring it now to the decision. We have some of the best lawyers in the country working on it. And the new executive order is being tailored to the decision we got down from the court. Okay?

Q Mr. President, Melania Trump announced the reopening of the White House Visitors Office.

THE PRESIDENT: Yes.

Q And she does a lot of great work for the country as well. Can you tell us a little bit about what First Lady Melania Trump does for the country? And there is a unique level of interest in your administration, so by opening the White House Visitors Office, what does that mean to you?

THE PRESIDENT: Now, that's what I call a nice question. That is very nice. Who are you with?

Q (Inaudible.)

THE PRESIDENT: Good. I'm going to start watching. Thank you very much.

Melania is terrific. She was here last night. We had dinner with Senator Rubio and his wife, who is, by the way, lovely. And we had a really good discussion about Cuba because we have very similar views on Cuba. And Cuba was very good to me in the Florida election as you know, the Cuban people, Americans. And I think that Melania is going to be outstanding. That's right, she just opened up the Visitors Center -- in other words, touring of the White House.

She, like others that she's working with, feels very, very strongly about women's issues, women's difficulties, very, very strongly. And she's a very, very strong advocate. I think she's a great representative for this country. And a funny thing happens because she gets so unfairly maligned. The things they say -- I've known her for a long time. She was a very successful person. She was a very successful model. She did really well. She would go home at night and didn't even want to go out with people. She was a very private person. She was always the highest quality that you'll ever find. And the things they say -- and I've known her for a long time -- the things they say are so unfair. And actually, she's been apologized to, as you know, by various media because they said things that were lies.

I'd just tell you this: I think she's going to be a fantastic First Lady. She's going to be a tremendous representative of women and of the people. And helping her and working with her will be Ivanka, who is a fabulous person and a fabulous, fabulous woman. And they're not doing this for money. They're not doing this for pay. They're doing this because they feel it, both of them. And Melania goes back and forth, and after Barron finishes school -- because it's hard to take a child out of school with a few months left -- she and Barron will be moving over to the White House. Thank you. That's a very nice question.

Go ahead.

Q Mr. President.

THE PRESIDENT: Yes. Oh, this is going to be a bad question but that's okay.

Q No, it's not going to be a bad question.

THE PRESIDENT: Good, because I enjoy watching you on television.

Q Well, thank you so much. Mr. President, I need to find out from you -- you said something as it relates to inner cities. That was one of your platforms during your campaign.

THE PRESIDENT: Fix the inner cities, yes.

Q Fixing the inner cities. What will be that fix and your urban agenda, as well as your HBCU executive order that's coming out this afternoon? See, it wasn't bad, was it?

THE PRESIDENT: That was very professional and very good.

Q I'm very professional.

THE PRESIDENT: We'll be announcing the order in a little while, and I'd rather let the order speak for itself. But it will be something I think that will be very good for everybody concerned. But we'll talk to you about that after we do the announcement.

As far as the inner cities, as you know, I was very strong on the inner cities during the campaign. I think it's probably what got me a much higher percentage of the African American vote than a lot of people thought I was going to get. We did much higher than people thought I was going to get and I was honored by that, including the Hispanic vote, which was also much higher. And, by the way, if I might add, including the women's vote, which was much higher than people thought I was going to get.

So we are going to be working very hard on the inner cities having to do with education, having to do with crime. We're going to try and fix as quickly as possible -- you know it takes a long time. It's taken 100 years or more for some of these places to evolve, and they evolved many of them very badly.

But we're going to be working very hard on health and health care; very, very hard on education. And also, we're going to working in a stringent way, and a very good way, on crime. You go to some of these inner city places, and it's so sad when you look at the crime. You have people -- and I've seen this, and I've sort of witnessed it. In fact, in two cases, I have actually witnessed it. They lock themselves into apartments, petrified to even leave, in the middle of the day. They're living in hell. We can't let that happen. So we're going to be very, very strong.

It's a great question, and it's a very difficult situation, because it's been many, many years. It's been festering for many, many years. But we have places in this country that we have to fix. We have to help African American people that, for the most part are stuck there -- Hispanic American people. We have Hispanic American people that are in the inner cities, and they're living in hell.

I mean, you look at the numbers in Chicago. There are two Chicagos, as you know. There's one Chicago that's incredible, luxurious and all, and safe. There's another Chicago that's worse than almost any of the places in the Middle East that we talk about, and that you talk about every night on the newscasts. So we're going to do a lot of work on the inner cities. I have great people lined up to help with the inner cities.

Q Well, when you say -- when you say the inner cities, are you going to include the CBC, Mr. President, in your conversations with your urban agenda, your inner city agenda, as well as your --

THE PRESIDENT: Am I going include who?

Q Are you going to include the Congressional Black Caucus and the Congressional Hispanic Caucus, as well as --

THE PRESIDENT: Well, I would. I tell you what, do you want to set up the meeting? Do you want to set up the meeting?

Q No, no, no.

THE PRESIDENT: Are they friends of yours?

Q I'm just a reporter.

THE PRESIDENT: No, go ahead, set up the meeting.

Q I know some of them, but I'm sure they're watching right now.

THE PRESIDENT: Let's go set up a meeting. I would love to meet with the Black Caucus. I think it's great -- the Congressional Black Caucus. I think it's great. I actually thought I had a meeting with Congressman Cummings, and he was all excited, and then he said, oh, I can't move, it might be bad for me politically, I can't have that meeting. I was all set to have the meeting. You know, we called him and called him, and he was all set. I spoke to him on the phone. Very nice guy.

Q I hear he wanted that meeting with you as well.

THE PRESIDENT: He wanted it. But we called, called, called, called -- they can't make a meeting with him. Every day, I walked in, I said, I would like to meet with him. Because I do want to solve the problem. But he probably was told by Schumer or somebody like that -- some other lightweight -- he was probably told -- he was probably told, don't meet with Trump, it's bad politics. And that's part of the problem of this country.

Okay, one more. Go ahead.

Q Yes, Mr. President, two questions --

THE PRESIDENT: No, no. One question. Two, we can't handle. This room can't handle two. Go ahead, give me the better of your two.

Q (Inaudible) it's not about your personality or your beliefs. We're talking about (inaudible) around the country, some of it by supporters in your name. What do you --

THE PRESIDENT: And some of it -- and can I be honest with you? And this has to do with racism and horrible things that are put up. Some of it written by our opponents. You do know that. Do you understand that? You don't think anybody would do a thing like that. Some of the signs you'll see are not put up by the people that love or like Donald Trump, they're put up by the other side, and you think it's like playing it straight. No. But you have some of those signs, and some of that anger is caused by the other side. They'll do signs and they'll do drawings that are inappropriate. It won't be my people. It will be the people on the other side to anger people like you. Okay.

Go ahead.

Q You are the President now. What are you going to do about it?

THE PRESIDENT: Who is that? Where is that? Oh, stand up. You can --

Q What are you going to do about the tensions that have been discussed?

THE PRESIDENT: Oh, I'm working on it. No, I'm working on it very hard.

Q Are you going to give a speech?

THE PRESIDENT: No, no, look. Hey, just so you understand, we had a totally divided country for eight years, and long before that, in all fairness to President Obama. Long before President Obama, we have had a very divided. I didn't come along and divide this country. This country was seriously divided before I got here.

We're going to work on it very hard. One of the questions that was asked -- I thought it was a very good question -- was about the inner cities. I mean, that's part of it. But we're going to work on education. We're going to work on lack -- you know, we're going to stop -- we're going to try and stop the crime. We have great law enforcement officials. We're going to try and stop crime. We're not going to try and stop, we're going to stop crime.

Remarks by President Trump in Press Conference | whitehouse.gov

Page 37 of 37

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/15/17 Page 162 of 191 PageID #: 2044

But it's very important to me. But this isn't Donald Trump that divided a nation. We went eight years with President Obama, and we went many years before President Obama. We lived in a divided nation. And I am going to try -- I will do everything within my power to fix that.

I want to thank everybody very much. It's a great honor to be with you. Thank you. Thank you very much. (Applause.)

END

2:13 P.M. EST



[HOME](#) [BRIEFING ROOM](#) [ISSUES](#) [THE ADMINISTRATION](#) [PARTICIPATE](#) [1600 PENN](#)

[USA.gov](#) | [Privacy Policy](#) | [Copyright Policy](#)

EXHIBIT Z

Supporting

Declaration of Karen C.

Tumlin

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 164 of 191 PageID #: 2046



AP NEWS Log in | Sign up

Transcript of AP interview with Trump

The Associated Press
Apr. 23, 2017



[https://www](https://www.apnews.com/c810d7de280a47e88848b0ac74690c83)

RELATED TOPICS

[Archive](#)

More from
[Archive](#)

A transcript of an Oval Office interview Friday with President Donald Trump by AP White House Correspondent Julie Pace. Where the audio recording of the interview is unclear, ellipses or a notation that the recording was unintelligible are used.

AP: I do want to talk to you about the 100 days.

TRUMP: Good.

AP: I want to ask a few questions on some topics that are happening toward the end of the interview.

TRUMP: Did you see Aya (Hijazi, an Egyptian-American charity worker who had been detained in the country for nearly three years) ...

AP: Can you tell me a little bit about how that came about?

TRUMP: No, just — you know, I asked the government to let her out. ...

TRUMP: You know Obama worked on it for three years, got zippo, zero.

AP: How did you hear about this story?

TRUMP: Many people, human rights people, are talking about it. It's an incredible thing, especially when you meet her. You realize — I mean, she was in a rough place.

AP: Did you have to strike a deal with (Egyptian President Abdel-Fattah) el-Sissi over this?

TRUMP: No. No deal. He was here. He — I said, "I really would appreciate it if you would look into this and let her out." And as you know, she went through a trial. And anyway, she was let go. And not only she, it was a total of eight people. ...

TRUMP: Yeah, it's funny: One of the best chemistries I had was with (German Chancellor Angela) Merkel.

(Crosstalk) AP: Really?

TRUMP: Chancellor Merkel.

TRUMP: And I guess somebody shouted out, "Shake her hand, shake her hand," you know. But I never heard it. But I had already shaken her hand four times. You know, because we were together for a long time.

AP: Did you expect you would have good chemistry with her?

TRUMP: No. Because, um, I'm at odds on, you know, the NATO payments and I'm at odds on immigration. We had unbelievable chemistry. And people have given me credit for having great chemistry with all of the leaders, including el-Sissi. ...

TRUMP: So it was a great thing to see that happen.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 166 of 191 PageID #: 2048

AP: Do you feel like you have changed the office of the presidency, how the presidency can be used to effect change?



TRUMP: I think the 100 days is, you know, it's an artificial barrier. It's not very meaningful. I think I've established amazing relationships that will be used the four or eight years, whatever period of time I'm here. I think for that I would be getting very high marks because I've established great relationships with countries, as President el-Sissi has shown and others have shown. Well, if you look at the president of China, people said they've never seen anything like what's going on right now. I really liked him a lot. I think he liked me. We have a great chemistry together. ...

TRUMP: I've developed great relationships with all of these leaders. Nobody's written that. In fact, they said, "Oh, well, he's not treating them nicely," because on NATO, I want them to pay up. But I still get along with them great, and they will pay up. In fact, with the Italian prime minister yesterday, you saw, we were joking, "Come on, you have to pay up, you have to pay up." He'll pay.

AP: Did he say that? In your meeting? Your private meeting?

TRUMP: He's going to end up paying. But you know, nobody ever asked the question. Nobody asked. Nobody ever asked him to pay up. So it's a different kind of a presidency.

AP: Do you feel like that's one thing that you've changed, that you maybe are actually asking the direct questions about some of these things?

TRUMP: Yeah. Let me give me an example. A little before I took office there was a terrible article about the F-35 fighter jet. It was hundreds of billions of dollars over budget. It was seven years behind schedule. It was a disaster. So I called in Lockheed and I said, "I'm sorry, we're going to have to bid this out to another company, namely Boeing," or whoever else. But Boeing. And I called in Boeing and I started getting competing offers back and forth. ...

TRUMP: I saved \$725 million on the 90 planes. Just 90. Now there are 3,000 planes that are going to be ordered. On 90 planes I saved \$725 million. It's actually a little bit more than that, but it's \$725 million. Gen. Mattis, who had to sign the deal when it came to his office, said, "I've never seen anything like this in my life." We went from a company that wanted more money for the planes to a company that cut. And the reason they cut — same planes, same everything — was because of me. I mean, because that's what I do.

TRUMP: Now if you multiply that times 3,000 planes, you know this is on 90 planes. In fact, when the Prime Minister (Shinzo) Abe of Japan came in because they bought a certain number of those ... The first thing he said to me, because it was right at the time I did it, he said, "Could I thank you?" I said, "What?" He said, "You saved us \$100 million." Because they got a \$100 million savings on the 10 or 12 planes that they (bought). Nobody wrote that story. Now you know that's a saving of billions and billions of dollars, many billions of dollars over the course of — it's between 2,500 and 3,000 planes will be the final order. But this was only 90 of those 2,500 planes.

AP: And you expect those savings to carry out across that full order?

TRUMP: More. I'm gonna get more than that. This was a thing that was out of control and now it's great. And the woman that runs Lockheed, Marillyn (Hewson), she was great. But all of a sudden it was a different kind of a thing. You know?

—

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 168 of 191 PageID #: 2050

AP: Do you feel like you've been able to apply that kind of a relationship to your dealings with Congress as well?

TRUMP: I have great relationships with Congress. I think we're doing very well and I think we have a great foundation for future things. We're going to be applying, I shouldn't tell you this, but we're going to be announcing, probably on Wednesday, tax reform. And it's — we've worked on it long and hard. And you've got to understand, I've only been here now 93 days, 92 days. President Obama took 17 months to do Obamacare. I've been here 92 days but I've only been working on the health care, you know I had to get like a little bit of grounding right? Health care started after 30 day(s), so I've been working on health care for 60 days. ...You know, we're very close. And it's a great plan, you know, we have to get it approved.

AP: Is it this deal that's between the Tuesday Group and the Freedom Caucus, is that the deal you're looking at?

TRUMP: So the Republican Party has various groups, all great people. They're great people. But some are moderate, some are very conservative. The Democrats don't seem to have that nearly as much. You know the Democrats have, they don't have that. The Republicans do have that. And I think it's fine. But you know there's a pretty vast area in there. And I have a great relationship with all of them. Now, we have government not closing. I think we'll be in great shape on that. It's going very well. Obviously, that takes precedent.

AP: That takes precedent over health care? For next week?

TRUMP: Yeah, sure. Next week. Because the hundred days is just an artificial barrier. The press keeps talking about the hundred days. But we've done a lot. You have a list of things. I don't have to read it.

AP: You did put out though, as a candidate, you put out a 100-day plan. Do you feel like you should be held accountable to that plan?

TRUMP: Somebody, yeah, somebody put out the concept of a hundred-day plan. But yeah. Well, I'm mostly there on most items. Go over the items, and I'll talk to you ...

(Crosstalk.)

TRUMP: But things change. There has to be flexibility. Let me give you an example. President Xi, we have a, like, a really great relationship. For me to call him a currency manipulator and then say, "By the way, I'd like you to solve the North Korean problem," doesn't work. So you have to have a certain flexibility, Number One. Number Two, from the time I took office till now, you know, it's a very exact thing. It's not like generalities. Do you want a Coke or anything?

AP: I'm OK, thank you. No. ...

TRUMP: But President Xi, from the time I took office, he has not, they have not been currency manipulators. Because there's a certain respect because he knew I would do something or whatever. But more importantly than him not being a currency manipulator the bigger picture, bigger than even currency manipulation, if he's helping us with North Korea, with nuclear and all of the things that go along with it, who would call, what am I going to do, say, "By the way, would you help us with North Korea? And also, you're a currency manipulator." It doesn't work that way.

AP: Right.

TRUMP: And the media, some of them get it, in all fairness. But you know some of them either don't get it, in which case they're very stupid people, or they just don't want to say it. You know because of a couple of them said, "He didn't call them a currency manipulator." Well, for two reasons. Number One, he's not, since my time. You know, very specific formula. You would think it's like generalities, it's not. They have — they've actually — their currency's gone up. So it's a very, very specific formula. And I said, "How badly have they been," ... they said, "Since you got to office they have not manipulated their currency." That's Number One, but much more important, they are working with

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 170 of 191 PageID #: 2052

us on North Korea. Now maybe that'll work out or maybe it won't. Can you imagine? ...

AP: So in terms of the 100-day plan that you did put out during the campaign, do you feel, though, that people should hold you accountable to this in terms of judging success?

TRUMP: No, because much of the foundation's been laid. Things came up. I'll give you an example. I didn't put Supreme Court judge on the 100 (day) plan, and I got a Supreme Court judge.

AP: I think it's on there.

TRUMP: I don't know. ...

AP: "Begin the process of selecting." You actually exceeded on this one. This says, "Begin the process of selecting a replacement."

TRUMP: That's the biggest thing I've done.

AP: Do you consider that your biggest success?

TRUMP: Well, I — first of all I think he's a great man. I think he will be a great, great justice of the Supreme Court. I have always heard that the selection and the affirmation of a Supreme Court judge is the biggest thing a president can do. Don't forget, he could be there for 40 years. ... He's a young man. I've always heard that that's the biggest thing. Now, I would say that defense is the biggest thing. You know, to be honest, there are a number of things. But I've always heard that the highest calling is the nomination of a Supreme Court justice. I've done one in my first 70 days.

TRUMP: Our military is so proud. They were not proud at all. They had their heads down. Now they have their heads up. ...

TRUMP: I'm rebuilding the military. We have great people. We have great things in place. We have tremendous borders. I mention the F-35 because if I can save \$725 million — look at that, that's a massive amount of money. And I'll save more as we make more planes. If I can save that on a small number of planes — Gen. (Jim) Mattis (the defense secretary) said, "I've

never seen anything like this,” because he had to sign the ultimate (unintelligible) ... He had to sign the ultimate, you know. He said, “I’ve never seen anything like this before, as long as I’ve been in the military.” You know, that kind of cutting.

AP: Right.

TRUMP: Now, if I can do that (unintelligible) ... As an example, the aircraft carriers, billions of dollars, the Gerald Ford, billions and billions over budget. That won’t happen.

AP: Is that something you’re going to take on?

TRUMP: (unintelligible) But as we order the other ones, because they want to order 12, the other ones are going to come in much less expensive. ...

AP: Can I ask you, over your first 100 days — you’re not quite there yet — how do you feel like the office has changed you?

TRUMP: Well the one thing I would say — and I say this to people — I never realized how big it was. Everything’s so (unintelligible) like, you know the orders are so massive. I was talking to —

AP: You mean the responsibility of it, or do you mean —

TRUMP: Number One, there’s great responsibility. When it came time to, as an example, send out the 59 missiles, the Tomahawks in Syria. I’m saying to myself, “You know, this is more than just like, 79 (sic) missiles. This is death that’s involved,” because people could have been killed. This is risk that’s involved, because if the missile goes off and goes in a city or goes in a civilian area — you know, the boats were hundreds of miles away — and if this missile goes off and lands in the middle of a town or a hamlet every decision is much harder than you’d normally make. (unintelligible) ... This is involving death and life and so many things. ... So it’s far more responsibility. (unintelligible)The financial cost of everything is so massive, every agency. This is thousands of times bigger, the United States, than the biggest company in the world. The

second-largest company in the world is the Defense Department. The third-largest company in the world is Social Security. The fourth-largest — you know, you go down the list.

AP: Right.

TRUMP. It's massive. And every agency is, like, bigger than any company. So you know, I really just see the bigness of it all, but also the responsibility. And the human responsibility. You know, the human life that's involved in some of the decisions.

AP: You've talked a little bit about the way that you've brought some business skills into the office. Is there anything from your business background that just doesn't translate into the presidency, that just simply is not applicable to this job?

TRUMP: Well in business, you don't necessarily need heart, whereas here, almost everything affects people. So if you're talking about health care — you have health care in business but you're trying to just negotiate a good price on health care, et cetera, et cetera. You're providing health. This is (unintelligible). Here, everything, pretty much everything you do in government, involves heart, whereas in business, most things don't involve heart.

AP: What's that switch been like for you?

TRUMP: In fact, in business you're actually better off without it.

AP: What's making that switch been like for you?

TRUMP: You have to love people. And if you love people, such a big responsibility. (unintelligible) You can take any single thing, including even taxes. I mean we're going to be doing major tax reform. Here's part of your story, it's going to be a big (unintelligible). Everybody's saying, "Oh, he's delaying." I'm not delaying anything. I'll tell you the other thing is (unintelligible). I used to get great press. I get the worst press. I get such dishonest reporting with the media. That's another thing that really has — I've never had anything like it before. It happened during the primaries, and I said, you know, when I won, I said,

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 173 of 191 PageID #: 2055

“Well the one thing good is now I’ll get good press.” And it got worse. (unintelligible) So that was one thing that a little bit of a surprise to me. I thought the press would become better, and it actually, in my opinion, got more nasty.

AP: But in terms of tax reform, how are you going to roll that out next week?

TRUMP: Well I’m going to roll (out) probably on Wednesday, around Wednesday of next week, we’re putting out a massive tax reform — business and for people — we want to do both. We’ve been working on it (unintelligible). Secretary Mnuchin is a very talented person, very smart. Very successful (unintelligible). ... We’re going to be putting that out on Wednesday or shortly thereafter. Let me leave a little room just in case (unintelligible). ... And that’s a big story, because a lot of people think I’m going to put it out much later.

AP: Do you have any details on that in terms of rates?

TRUMP: Only in terms that it will be a massive tax cut. It will be bigger, I believe, than any tax cut ever. Maybe the biggest tax cut we’ve ever had. ...

AP: Obviously, that’s going to come in a week where you’re going to be running up against the deadline for keeping the government open. If you get a bill on your desk that does not include funding for the wall, will you sign it?

TRUMP: I don’t know yet. People want the border wall. My base definitely wants the border wall, my base really wants it — you’ve been to many of the rallies. OK, the thing they want more than anything is the wall. My base, which is a big base; I think my base is 45 percent. You know, it’s funny. The Democrats, they have a big advantage in the electoral college. Big, big, big advantage. I’ve always said the popular vote would be a lot easier than the electoral college. The electoral college — but it’s a whole different campaign (unintelligible). The electoral college is very difficult for a Republican to win, and I will tell

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 174 of 191 PageID #: 2056

you, the people want to see it. They want to see the wall, they want to see security. Now, it just came out that they're 73 percent down. ... That's a tremendous achievement. ... Look at this, in 100 days, that down to the lowest in 17 years and it's going lower. Now, people aren't coming because they know they're not going to get through, and there isn't crime. You know the migration up to the border is horrible for women, you know that? (Unintelligible.) Now, much of that's stopped because they can't get through.

AP: It sounds like maybe you're beginning to send a message that if you do get a spending bill that doesn't have border funding in there, you would sign it.

TRUMP: Well, first of all, the wall will cost much less than the numbers I'm seeing. I'm seeing numbers, I mean, this wall is not going to be that expensive.

AP: What do you think the estimate on it would be?

TRUMP: Oh I'm seeing numbers — \$24 billion, I think I'll do it for \$10 billion or less. That's not a lot of money relative to what we're talking about. If we stop 1 percent of the drugs from coming in — and we'll stop all of it. But if we stop 1 percent of the drugs because we have the wall — they're coming around in certain areas, but if you have a wall, they can't do it because it's a real wall. That's a tremendously good investment, 1 percent. The drugs pouring through on the southern border are unbelievable. We're becoming a drug culture, there's so much. And most of it's coming from the southern border. The wall will stop the drugs.

AP: But, just trying to nail you down on it one more time, will you sign a spending bill if it doesn't have —

TRUMP: I don't want to comment. I just don't know yet. I mean, I have to see what's going on. I really do. But the wall's a very important thing to — not only my base, but to the people. And even if it wasn't, I mean I'll do things that aren't necessarily popular. ... The wall is very important to stopping drugs.

AP: If you don't have a funding stream, your message to your base is what?

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 175 of 191 PageID #: 2057

TRUMP: My base understands the wall is going to get built, whether I have it funded here or if I get it funded shortly thereafter, that wall's getting built, OK? One hundred percent. One hundred percent it's getting built. And it's also getting built for much less money — I hope you get this — than these people are estimating. The opponents are talking \$25 billion for the wall. It's not going to cost anywhere near that.

AP: You think \$10 billion or less.

TRUMP: I think \$10 billion or less. And if I do a super-duper, higher, better, better security, everything else, maybe it goes a little bit more. But it's not going to be anywhere near (those) kind of numbers. And they're using those numbers; they're using the high numbers to make it sound impalatable (sic). And the fact it's going to cost much less money, just like the airplane I told you about, which I hope you can write about.

—

(Off-the-record discussion.)

—

TRUMP: They had a quote from me that NATO's obsolete. But they didn't say why it was obsolete. I was on Wolf Blitzer, very fair interview, the first time I was ever asked about NATO, because I wasn't in government. People don't go around asking about NATO if I'm building a building in Manhattan, right? So they asked me, Wolf ... asked me about NATO, and I said two things. NATO's obsolete — not knowing much about NATO, now I know a lot about NATO — NATO is obsolete, and I said, "And the reason it's obsolete is because of the fact they don't focus on terrorism." You know, back when they did NATO there was no such thing as terrorism.

AP: What specifically has NATO changed?

TRUMP: (Cites Wall Street Journal article) ... I did an interview with Wolf Blitzer, and I said NATO was obsolete — I said two things — obsolete, and the country's aren't paying. I was right about both. I took such heat for about three days on both, because nobody ever criticized NATO. I took heat like you

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 176 of 191 PageID #: 2058

wouldn't believe. And then some expert on NATO said, "You know, Trump is right." But I said it was obsolete because they weren't focused on terror. ...

It's not fair that we're paying close to 4 percent and other countries that are more directly affected are paying 1 percent when they're supposed to be paying 2 percent. And I'm very strong on it and I'm going to be very strong on it when I go there in a month."

—

AP: This morning you tweeted that after the possible terrorist attack in Paris, that it will have a big effect on the upcoming French election. What did you mean by that?

TRUMP: Well, I think it will have a big effect on who people are going to vote for in the election.

AP: Do you think it's going to help Marine Le Pen?

TRUMP: I think so.

AP: Do you believe that she should be the president?

TRUMP: No, I have no comment on that, but I think that it'll probably help her because she is the strongest on borders and she is the strongest on what's been going on in France.

AP: Do you worry at all that by saying that, that a terrorist attack would have an impact on a democratic election, that it would actually embolden terrorists to try to —.

TRUMP: No. Look, everybody is making predictions who is going to win. I am no different than you, you could say the same thing. ...

AP: I just wonder if you are encouraging, you are the president of the United States, so to say that you worry that it encourages terrorists ...

TRUMP: No, I am no different than — no, I think it discourages terrorists, I think it discourages. I think what we've done on the border discourages it. I think that my stance on having people

come in to this country that we have no idea who they are and in certain cases you will have radical Islamic terrorism. I'm not going to have it in this country. I'm not going to let what happened to France and other places happen here. And it's already largely, you know — we have tens — we have hundreds of thousands of people that have been allowed into our country that should not be here. They shouldn't be here. We have people allowed into our country with no documentation whatsoever. They have no documentation and they were allowed under the previous administrations, they were allowed into our country. It's a big mistake.

AP: Just so that I am clear. You are not endorsing her for the office, but you are —

TRUMP: I am not endorsing her and I didn't mention her name.

AP: Right, I just wanted to make sure I have that clear.

TRUMP: I believe whoever is the toughest on radical Islamic terrorism and whoever is the toughest at the borders will do well at the election. I am not saying that person is going to win, she is not even favored to win, you know. Right now, she is in second place.

—

AP: I have a question on the markets, actually. One thing that I think has been different about this White House is that you do point to the markets as a sign of progress. Do you worry, though — I mean, the markets go up and down.

TRUMP: You live by the sword, you die by the sword, to a certain extent. But we create a lot of jobs, 500,000 jobs as of two months ago, and plenty created since. Five hundred thousand. ... As an example, Ford, General Motors. I've had cases where the gentleman from China, Ma, Jack Ma (chairman of Alibaba Group), he comes up, he says, "Only because of you am I making this massive investment." Intel, only because of you. ... The press never writes that.

—

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 178 of 191 PageID #: 2060

AP: What about NAFTA? What's the plan on NAFTA?

TRUMP: What would you like to know?

AP: I would like to know what your plan is in terms of renegotiating.

TRUMP: I am very upset with NAFTA. I think NAFTA has been a catastrophic trade deal for the United States, trading agreement for the United States. It hurts us with Canada, and it hurts us with Mexico. Most people don't even think of NAFTA in terms of Canada. You saw what happened yesterday in my statements, because if you look at the dairy farmers in Wisconsin and upstate New York, they are getting killed by NAFTA.

AP: Is your plan still, though, to renegotiate the whole deal?

TRUMP: I am going to either renegotiate it or I am going to terminate it.

AP: Termination is still on the table.

TRUMP: Absolutely. If they don't treat fairly, I am terminating NAFTA.

AP: What's a timeline for that decision?

TRUMP: It's a six-month termination clause, I have the right to do it, it's a six-month clause.

AP: If I could fit a couple of more topics. Jeff Sessions, your attorney general, is taking a tougher line suddenly on Julian Assange, saying that arresting him is a priority. You were supportive of what WikiLeaks was doing during the campaign with the release of the Clinton emails. Do you think that arresting Assange is a priority for the United States?

TRUMP: When Wikileaks came out ... never heard of Wikileaks, never heard of it. When Wikileaks came out, all I was just saying is, "Well, look at all this information here, this is pretty good stuff." You know, they tried to hack the Republican, the RNC,

but we had good defenses. They didn't have defenses, which is pretty bad management. But we had good defenses, they tried to hack both of them. They weren't able to get through to Republicans. No, I found it very interesting when I read this stuff and I said, "Wow." It was just a figure of speech. I said, "Well, look at this. It's good reading."

AP: But that didn't mean that you supported what Assange is doing?

TRUMP: No, I don't support or unsupport. It was just information. They shouldn't have allowed it to get out. If they had the proper defensive devices on their internet, you know, equipment, they wouldn't even allow the FBI. How about this — they get hacked, and the FBI goes to see them, and they won't let the FBI see their server. But do you understand, nobody ever writes it. Why wouldn't (former Hillary Clinton campaign chairman John) Podesta and Hillary Clinton allow the FBI to see the server? They brought in another company that I hear is Ukrainian-based.

AP: CrowdStrike?

TRUMP: That's what I heard. I heard it's owned by a very rich Ukrainian, that's what I heard. But they brought in another company to investigate the server. Why didn't they allow the FBI in to investigate the server? I mean, there is so many things that nobody writes about. It's incredible.

AP: Can I just ask you, though — do you believe it is a priority for the United States, or it should be a priority, to arrest Julian Assange?

TRUMP: I am not involved in that decision, but if Jeff Sessions wants to do it, it's OK with me. I didn't know about that decision, but if they want to do it, it's OK with me.

—

AP: On Iran, which is another thing you talked a lot on the campaign —

TRUMP: And the other thing that we should go after is the leakers. ...

AP: On Iran, you also talked about it quite a bit on the campaign trail. And you said in the press conference yesterday that you think that Iran is violating the spirit of the agreement. When you say that, do you mean in terms of the actual nuclear accord, or do you mean what they are doing in the region?

TRUMP: In terms of what they are doing all over the Middle East and beyond.

AP: So you believe that they are complying with the agreement?

TRUMP: No, I don't say that. I say that I believe they have broken the spirit of the agreement. There is a spirit to agreements, and they have broken it.

AP: In terms of what they are doing elsewhere in the Middle East?

TRUMP: In terms of what they are doing of all over.

AP: When you talk to European leaders, when you talk to Merkel, for example, or Teresa May, what do they say about the nuclear deal? Do they want you to stay in that deal?

TRUMP: I don't talk to them about it.

AP: You don't talk to them about the Iran deal?

TRUMP: I mention it, but it's very personal when I talk to them, you know, it's confidential. No, they have their own opinions. I don't say that they are different than my opinions, but I'd rather have you ask them that question.

AP: At this point, do you believe that you will stay in the nuclear deal?

TRUMP: It's possible that we won't.

—

AP: Dreamers, you've talked about them, you've talked about heart earlier. This is one area where you have talked —

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 181 of 191 PageID #: 2063

Transcript of AP interview with Trump

TRUMP: No, we aren't looking to do anything right now. Look, the dreamers ... this is an interesting case, they left and they came back and he's got some problems, it's a little different than the dreamer case, right? But we are putting MS-13 in jail and getting them the hell out of our country. They've taken over towns and cities and we are being really brutal with MS-13, and that's what we should be. They are a bad group, and somebody said they are as bad as al-Qaida, which is a hell of a reference. So we are moving criminals out of our country and we are getting them out in record numbers and those are the people we are after. We are not after the dreamers, we are after the criminals.

AP: And that's going to be the policy of your administration to allow the dreamers to stay?

TRUMP: Yes. Yes. That's our policy. I am not saying ... long-term, we are going to have to fix the problem, the whole immigration problem. But I will tell you: Right now we have a great gentleman, one of my real stars is Gen. (John) Kelly, now (Homeland Security) Secretary Kelly. We are down 73 percent at the border, we are cleaning out cities and towns of hard-line criminals, some of the worst people on earth, people that rape and kill women, people that are killing people just for the sake of having fun. They are being thrown in jails and they are being ... all over the country and nobody's ever done it like us, so we are being unbelievably thorough with that. We are out in Long Island cleaning out the MS-13 scum, they are all scum, that's probably the worst gang anywhere on Earth. ...

AP: A lot of the dreamers have been hoping to hear something from you. I don't want to give them the wrong message with this.

TRUMP: Here is what they can hear: The dreamers should rest easy. OK? I'll give you that. The dreamers should rest easy. ...

—

(An aide talks about the president's address to Congress.)

TRUMP: A lot of the people have said that, some people said it was the single best speech ever made in that chamber.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 182 of 191 PageID #: 2064

AP: You seem like you enjoyed it.

TRUMP: I did. I did. I believed in it and I enjoyed it. It was a great feeling to introduce the wife of a great young soldier who died getting us very valuable information. Have you seen the tremendous success? ... That's another thing that nobody talks about. Have you seen the tremendous success we've had in the Middle East with the ISIS (an abbreviation for the Islamic State group)? When (current Iraqi Prime Minister Haider al) Abadi left from Iraq, he said Trump has more success in eight weeks than Obama had in eight years. ... We have had tremendous success, but we don't talk about it. We don't talk about it.

AP: Do you mean you don't talk about it personally because you don't want to talk about it?

TRUMP: I don't talk about it. No. And the generals don't talk about it.

—

AP: You had put a request into the Pentagon to put forward an ISIS plan within 30 days. I know they have sent that over. Have you accepted a plan? Are you moving forward on a strategy?

TRUMP: We have a very strong plan, but we cannot talk about it, Julie.

AP: So you have decided on a plan?

TRUMP: Remember how many times have you been to the speech where I talked about Mosul.

AP: Right.

TRUMP: Right. Mosul. Four months we are going in, three months. We are still fighting Mosul. You know why? Because they were prepared. If we would have gone in and just done it, it would have been over three months ago.

AP: Can you say generally what the strategy is? Should people —

TRUMP: Generally is we have got to get rid of ISIS. We have no choice. And other terrorist organizations.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 183 of 191 PageID #: 2065

AP: Should Americans who are serving in the military expect that you are going to increase troop numbers in the Middle East to fight ISIS?

TRUMP: No, not much.

AP: In terms of the strategy, though, that you have accepted, it sounds like, from the generals —

TRUMP: Well, they've also accepted my strategy.

AP: Does that involve more troops on the ground, it sounds like?

TRUMP: Not many.

AP: So a small increase?

TRUMP: It could be an increase, then an increase. But not many more. I want to do the job, but not many more. ... This is an important story. I've done a lot. I've done more than any other president in the first 100 days and I think the first 100 days is an artificial barrier. And I'm scheduled ... the foundations have been set to do some great things. With foreign countries. Look at, look at President Xi. I mean ...

AP: What do you think it was about your chemistry?

TRUMP: We had good chemistry. Now I don't know that I think that's going to produce results but you've got a good chance.

AP: Uh-huh.

TRUMP: Look, he turned down many coal ships. These massive coal ships are coming where they get a lot of their income. They're coming into China and they're being turned away. That's never happened before. The fuel, the oil, so many different things. You saw the editorial they had in their paper saying they cannot be allowed to have nuclear, you know, et cetera. People have said they've never seen this ever before in China. We have the same relationship with others. There's a great foundation that's built. Great foundation. And I think it's going to produce tremendous results for our country.

AP: One more 100 days question.

TRUMP: That's fine.

AP: ... is do you think you have the right team in place for your next 100 days?

TRUMP: Yes. I think my team has been, well, I have different teams. I think my military team has been treated with great respect. As they should be. I think my other team hasn't been treated with the respect that they should get. We have some very talented people, and very diverse people.

AP: Do you mean your White House team when you say that?

TRUMP: Yeah, my White House team. I think Reince (Priebus) has been doing an excellent job. I think that, you know, this is a very tough environment not caused necessarily by me. Although the election has, you know, look, the Democrats had a tremendous opportunity because the electoral college, as I said, is so skewed to them. You start off by losing in New York and California, no matter who it is. If, if Abe Lincoln came back to life, he would lose New York and he would lose California. It's just the registration, there's nothing you can do. So you're losing the two biggest states, that's where you start. OK. The Electoral College is so skewed in favor of a Democrat that it's very, very hard. Look at Obama's number in the Electoral College. His numbers on the win were ... but the Electoral College numbers were massive. You lose New York, you lose Illinois. Illinois is impossible to win. And you look at, so now you lose New York, Illinois, no matter what you do, and California. Right. And you say, man. Now you have to win Florida, you have to win Ohio, you have to win North Carolina. You have to win all these states, and then I won Wisconsin and Michigan and all of these other places, but you remember there was no way to, there was no way to 270.

AP: Right.

TRUMP: So she had this massive advantage, she spent hundreds of millions of dollars more money than I spent. Hundreds of millions ... Yeah. Or more, actually because we were \$375 she was at \$2.2 billion. But whatever. She spent massive amounts of

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 185 of 191 PageID #: 2067

money more and she lost. Solidly lost, because you know it wasn't 270, it was 306. So there's anger. But there was massive anger before I got there, so it's not easy for a White House staff to realize that you are going into a situation where you are going to be at no, where are going to get no votes. I mean, here's a judge who is No. 1 at Columbia, No. 1 at Harvard and an Oxford scholar. And he got three votes.

AP: Three Democratic votes, but yeah.

TRUMP: Three Democratic votes. OK. He's an Oxford scholar at the highest level. The No. 1, you know, one of the great academics, one of the great writers. No bad decisions with all ... nothing. He's like a ...

AP: Do you think that you can break through that? I mean this

—

TRUMP: Yeah, I do.

AP: Is one of the biggest challenges for a president.

TRUMP: I think (I) can to an extent. But there's a, there's a basic hard-line core that you can't break though, OK, that you can't break through. There's a hard-line group you can't break through, you can't. It's sad. You can't. Look, I met with Congressman Cummings and I really liked him, a lot. Elijah Cummings (of Maryland). I really liked him a lot. And during the conversation because we have a very strong mutual feeling on drug prices. He came to see me, at my invitation, because I saw him talking about, he came to see me about drug prices because drug prices are ridiculous. And I am going to get them way, way, way down and he liked that. He said you will be the greatest president. He said you will be, in front of five, six people, he said you will be the greatest president in the history of this country.

AP: He disputed that slightly.

TRUMP: That's what he said. I mean, what can I tell you?

AP: Yeah.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 186 of 191 PageID #: 2068

TRUMP: There's six people sitting here. What did he, what, what do you mean by slightly?

AP: He said, he said that he felt like you could be a great president if and then —

TRUMP: Well he said, you'll be the greatest president in the history of, but you know what, I'll take that also, but that you could be. But he said, will be the greatest president but I would also accept the other. In other words, if you do your job, but I accept that. Then I watched him interviewed and it was like he never even was here. It's incredible. I watched him interviewed a week later and it's like he was never in my office. And you can even say that.

—
AP: And that's one of the difficulties I think presidents have had is that you can have these personal relationships with people from the other party, but then it's hard to actually change how people vote or change how people —

TRUMP: No I have, it's interesting, I have, seem to get very high ratings. I definitely. You know Chris Wallace had 9.2 million people, it's the highest in the history of the show. I have all the ratings for all those morning shows. When I go, they go double, triple. Chris Wallace, look back during the Army-Navy football game, I did his show that morning.

AP: I remember, right.

TRUMP: It had 9.2 million people. It's the highest they've ever had. On any, on air, (CBS "Face the Nation" host John) Dickerson had 5.2 million people. It's the highest for "Face the Nation" or as I call it, "Deface the Nation." It's the highest for "Deface the Nation" since the World Trade Center. Since the World Trade Center came down. It's a tremendous advantage.

I have learned one thing, because I get treated very unfairly, that's what I call it, the fake media. And the fake media is not all of the media. You know they tried to say that the fake media was all the, no. The fake media is some of you. I could tell you who it is, 100 percent. Sometimes you're fake, but — but the fake

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 187 of 191 PageID #: 2069

media is some of the media. It bears no relationship to the truth. It's not that Fox treats me well, it's that Fox is the most accurate.

AP: Do you believe that? That Fox —

TRUMP: I do. I get treated so badly. Yesterday, about the thing, you know when I said it's a terrorism ... it may be. I said it may be a terrorist attack and MSNBC, I heard, went crazy, "He called it a terrorist attack." They thought it was a bank robbery. By the way, I'm 10-0 for that. I've called every one of them. Every time they said I called it way too early and then it turns out I'm ... Whatever. Whatever. In the meantime, I'm here and they're not.

—
AP: Do you feel that one of the things with cable is there's such real-time reaction with everything you say?

TRUMP: Yeah.

AP: Can you separate that sometimes from that actual decision?

TRUMP: The one thing —

AP: That you have to do —

TRUMP: OK. The one thing I've learned to do that I never thought I had the ability to do. I don't watch CNN anymore.

AP: You just said you did.

TRUMP: No. No, I, if I'm passing it, what did I just say (inaudible)?

AP: You just said —

TRUMP: Where? Where?

AP: Two minutes ago.

TRUMP: No, they treat me so badly. No, I just said that. No, I, what'd I say, I stopped watching them. But I don't watch CNN anymore. I don't watch MSNBC. I don't watch it. Now I heard yesterday that MSNBC, you know, they tell me what's going on.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 188 of 191 PageID #: 2070

AP: Right.

TRUMP: In fact, they also did. I never thought I had the ability to not watch. Like, people think I watch (MSNBC's) "Morning Joe." I don't watch "Morning Joe." I never thought I had the ability to, and who used to treat me great by the way, when I played the game. I never thought I had the ability to not watch what is unpleasant, if it's about me. Or pleasant. But when I see it's such false reporting and such bad reporting and false reporting that I've developed an ability that I never thought I had. I don't watch things that are unpleasant. I just don't watch them.

AP: And do you feel like that's, that's because of the office that you now occupy —

TRUMP: No.

AP: That you've made that change?

TRUMP: I don't know why it is, but I've developed that ability, and it's happened over the last, over the last year.

AP: That's interesting.

TRUMP: And I don't watch things that I know are going to be unpleasant. CNN has covered me unfairly and incorrectly and I don't watch them anymore. A lot of people don't watch them anymore, they're now in third place. But I've created something where people are watching ... but I don't watch CNN anymore. I don't watch MSNBC anymore. I don't watch things, and I never thought I had that ability. I always thought I'd watch.

AP: Sure.

TRUMP: I just don't. And that's taken place over the last year. And you know what that is, that's a great, it's a great thing because you leave, you leave for work in the morning you know, you're, you don't watch this total negativity. I never thought I'd be able to do that and for me, it's so easy to do now. Just don't watch.

AP: That's interesting.

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 189 of 191 PageID #: 2071

Transcript of AP interview with Trump

TRUMP: Maybe it's because I'm here. I don't know.

More From AP

by Taboola

Coroner: Comic died from high blood pressure, heart disease

JK Rowling, Warner Bros. voice support for Johnny Depp

'Jeopardy!' winner charged with computer crimes in Michigan

Man found with bloody body in car outside Florida city hall

Ad Content

Sponsored Links by Taboola

Cardiologist Warns: Throw Out Your Probiotics Now

Gundry MD

The Sweatshirt Designed by an Apple Engineer That's Bringing Manufacturing Back to America

Business Insider | American Giant

Reclusive Millionaire Warns Retirees: "Get Out Of Cash Now"

DailyWealth

Teen Kicked Out Of Prom When Adults Can't Stop Staring

Design Bump

Plano Magnum HipRoof Tray Tackle Box - 8616

\$29.99 - basspro.com

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 190 of 191 PageID #: 2072

12 Amazingly Cool Gadgets Flying off Shelves

Lifed

Nadia Comaneci Finally Confirms The Rumors

companion

This device has revolutionized the hearing aid.

Eargo Plus Hearing Aids

[VIEW MORE](#)

12/11/2017

Case 1:16-cv-04756-NGG-JO Document 123-5 Filed 12/19/17 Page 191 of 191 PageID #: 2073

Transcript of AP interview with Trump

AP NEWS

About
Terms and Conditions
Privacy

THE ASSOCIATED PRESS

About Us
Products and Services
Media Center
Company
Contact Us
Careers

MORE FROM AP

AP Images
AP Archives
AP Video Hub

FOLLOW AP



All contents © copyright 2017 Associated Press. All rights reserved.

EXHIBIT AA

JEFFREY M. DAVIDSON (SBN 248620)
 ALAN BERSIN (SBN 63874)
 COVINGTON & BURLING LLP
 One Front Street, 35th Floor
 San Francisco, CA 94111-5356
 Telephone: (415) 591-6000
 Facsimile: (415) 591-6091
 Email: jdavidson@cov.com,
 abersin@cov.com
*Attorneys for Plaintiffs The Regents of the
 University of California and Janet Napolitano, in
 her official capacity as President of the
 University of California*

THEODORE J. BOUTROUS, JR. (SBN 132099)
 ETHAN D. DETTMER (SBN 196046)
 JESSE S. GABRIEL (SBN 263137)
 GIBSON, DUNN & CRUTCHER LLP
 333 South Grand Avenue
 Los Angeles, CA 90071-3197
 Telephone: (213) 229-7000
 Facsimile: (213) 229-7520
 Email: tboutrous@gibsondunn.com,
 edettmer@gibsondunn.com,
 jgabriel@gibsondunn.com
*Attorneys for Plaintiffs Dulce Garcia, Miriam
 Gonzalez Avila, Saul Jimenez Suarez, Viridiana
 Chabolla Mendoza, Norma Ramirez, and Jirayut
 Latthivongskorn*

XAVIER BECERRA
 Attorney General of California
 MICHAEL L. NEWMAN
 Supervising Deputy Attorney General
 JAMES F. ZAHRADKA II (SBN 196822)
 1515 Clay Street, 20th Floor
 P.O. Box 70550
 Oakland, CA 94612-0550
 Telephone: (510) 879-1247
 Email: James.Zahradka@doj.ca.gov
Attorneys for Plaintiff State of California

JOSEPH W. COTCHETT (SBN 36324)
 NANCY L. FINEMAN (SBN 124870)
 COTCHETT, PITRE & MCCARTHY, LLP
 San Francisco Airport Office Center
 840 Malcolm Road, Suite 200
 Burlingame, CA 94010
 Telephone: (650) 697-6000
 Facsimile: (650) 697-0577
 Email: nfineman@cpmlegal.com
Attorneys for Plaintiff City of San Jose

JONATHAN WEISSGLASS (SBN 185008)
 STACEY M. LEYTON (SBN 203827)
 ERIC P. BROWN (SBN 284245)
 ALTSHULER BERZON LLP
 177 Post Street, Suite 300
 San Francisco, CA 94108
 Telephone: (415) 421-7151
 Facsimile: (415) 362-8064
 Email: jweissglass@altber.com
*Attorneys for Plaintiffs County of Santa Clara and
 Service Employees International Union Local 521*

**UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA
 SAN FRANCISCO DIVISION**

THE REGENTS OF THE UNIVERSITY OF
 CALIFORNIA and JANET NAPOLITANO,
 in her official capacity as President of the
 University of California,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
 SECURITY and ELAINE DUKE, in her
 official capacity as Acting Secretary of the
 Department of Homeland Security,

Defendants.

CASE NO. 17-CV-05211-WHA

**DECLARATION OF DR. CLARENCE
 BRADDOCK III**

1 STATE OF CALIFORNIA, STATE OF
2 MAINE, STATE OF MARYLAND, and
STATE OF MINNESOTA,

3 Plaintiffs,

4 v.

5 U.S. DEPARTMENT OF HOMELAND
6 SECURITY, ELAINE DUKE, in her official
capacity as Acting Secretary of the
7 Department of Homeland Security, and the
UNITED STATES OF AMERICA,

8 Defendants.

CASE NO. 17-CV-05235-WHA

9 CITY OF SAN JOSE, a municipal corporation,

10 Plaintiffs,

11 v.

12 DONALD J. TRUMP, President of the United
13 States, in his official capacity, ELAINE C.
DUKE, in her official capacity, and the
14 UNITED STATES OF AMERICA,

15 Defendants.

CASE NO. 17-CV-05329-WHA

16 DULCE GARCIA, MIRIAM GONZALEZ
17 AVILA, SAUL JIMENEZ SUAREZ,
VIRIDIANA CHABOLLA MENDOZA,
18 NORMA RAMIREZ, and JIRAYUT
LATTHIVONGSKORN,

19 Plaintiffs,

20 v.

21 UNITED STATES OF AMERICA, DONALD
J. TRUMP, in his official capacity as President
22 of the United States, U.S. DEPARTMENT OF
HOMELAND SECURITY, and ELAINE
23 DUKE, in her official capacity as Acting
Secretary of Homeland Security,

24 Defendants.

CASE NO. 17-CV-05380-WHA

COUNTY OF SANTA CLARA and
SERVICE EMPLOYEES INTERNATIONAL
UNION LOCAL 521,

CASE NO. 17-CV-05813-WHA

Plaintiffs,

v.

DONALD J. TRUMP, in his official capacity
as President of the United States, JEFFERSON
BEAUREGARD SESSIONS, in his official
capacity as Attorney General of the United
States; ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security; and U.S.
DEPARTMENT OF HOMELAND
SECURITY,

Defendants.

1 I, CLARENCE BRADDOCK III, DECLARE:

2 1. I am Vice Dean of Education at the David Geffen School of Medicine at the University of
3 California Los Angeles ("UCLA Medicine"). The matters set forth herein are true and correct of my
4 own personal knowledge and, if called as a witness, I could and would testify competently thereto.

5 2. I have been Vice Dean of Education at UCLA Medicine for nearly four years. In my
6 position, I oversee all aspects of medical education, including undergraduate, graduate, and postgraduate
7 medical programs. I develop, manage, and implement strategies, initiatives and programs to promote
8 and support education and training.

9 3. We have several Deferred Action for Childhood Arrivals ("DACA") status medical
10 students at UCLA Medicine, including 4th year medical students. The David Geffen School of
11 Medicine, like the wider University of California system, is dedicated to providing a place for students
12 who are the most qualified, meritorious and committed to their medical training and future patient care.
13 The DACA students currently enrolled at the David Geffen School of Medicine exemplify these
14 qualities. They are emblematic of our fundamental role as an institution of higher learning: to train the
15 most talented, hard-working, passionate young scholars to become the doctors and biomedical
16 researchers of tomorrow, regardless of gender, race, ethnicity or citizenship. These students are here not
17 because of their DACA status, but because they are exceptionally qualified and share a genuine desire to
18 care for, and heal, the sick.

19 4. If these UCLA medical student and residents lose their DACA status, they become
20 unemployable as physicians. They will not be able to practice medicine or even complete their residency
21 in the United States as both require employment authorization. Without DACA, these students and
22 residents would have no choice but to leave the United States in order to become practicing physicians.
23 This would result in a loss of promising young doctors from our medical care system.

24 5. The DACA policy rescission has also created the specific risk that our fourth year
25 students will not be offered medical residency positions. Because they will lose their employment
26 authorization without DACA status, they will be unable to complete or potentially even start their
27 residency programs. Our faculty and UCLA residency program advisors have shared with me their
28 significant concern about DACA students losing their status before or during residency, which means

1 that our hard-working and bright DACA students might not be offered residency interviews and/or
2 positions at all. This concern has become so acute that UCLA Medicine has offered to include language
3 in the Dean's Letter for our fourth year students explaining DACA status and expressing our support for
4 our DACA students. A Dean's Letter is provided to fourth year students applying for residency to
5 describe each student's potential as a doctor and encourage their acceptance into a residency program.
6 This language is being included in hopes it might help DACA students be considered for residency
7 programs.

8 6. Our DACA students have played an important role in enriching UCLA Medicine's
9 educational environment and curriculum. At UCLA Medicine, we consider cultivating a diverse
10 academic community as a way to drive excellence. A significant part of a medical student's training as a
11 future physician is cultural sensitivity and a thoughtful, candid, respectful connection with patients,
12 community members, and peers. Our DACA students come from incredibly diverse backgrounds and in
13 my experience have helped their peers to build a more culturally sensitive and competent educational
14 environment by sharing their perspectives and shaping our curriculum. For example, DACA students
15 have provided unique insight on delivering care to immigrant populations, stemming from their
16 understanding of both the American health system and the challenges immigrant families and
17 communities often face. Our DACA students are often able to draw on their own and their family's
18 experiences—in a way their peers cannot easily do—to provide context for the patient's choices and the
19 right approach to delivering health care to that patient. As a medical educator, I believe that first-hand
20 perspectives help all of our students to develop essential empathy and cross-cultural understanding that
21 makes them better doctors for California's diverse population.

22 7. Our DACA students' unique perspectives have also driven specific improvements in our
23 curriculum. Among the foundational concepts of our medical curriculum are understanding concepts
24 like implicit bias, stereotype threat, and micro-aggressions. Our DACA students brought to UCLA
25 Medicine's attention that some of our own case studies contained stereotypical descriptions and bias in
26 the terms used to describe a minority patient and, in another case, a migrant worker. This started
27 conversations about the existence of stereotypes and bias in the healthcare environment led by DACA
28 students, which sparked changes to these cases in our curriculum.

EXHIBIT BB

JEFFREY M. DAVIDSON (SBN 248620)
 ALAN BERSIN (SBN 63874)
 COVINGTON & BURLING LLP
 One Front Street, 35th Floor
 San Francisco, CA 94111-5356
 Telephone: (415) 591-6000
 Facsimile: (415) 591-6091
 Email: jdavidson@cov.com,
 abersin@cov.com
*Attorneys for Plaintiffs The Regents of the
 University of California and Janet Napolitano, in
 her official capacity as President of the
 University of California*

THEODORE J. BOUTROUS, JR. (SBN 132099)
 ETHAN D. DETTMER (SBN 196046)
 JESSE S. GABRIEL (SBN 263137)
 GIBSON, DUNN & CRUTCHER LLP
 333 South Grand Avenue
 Los Angeles, CA 90071-3197
 Telephone: (213) 229-7000
 Facsimile: (213) 229-7520
 Email: tboutrous@gibsondunn.com,
 edettmer@gibsondunn.com,
 jgabriel@gibsondunn.com
*Attorneys for Plaintiffs Dulce Garcia, Miriam
 Gonzalez Avila, Saul Jimenez Suarez, Viridiana
 Chabolla Mendoza, Norma Ramirez, and Jirayut
 Latthivongskorn*

XAVIER BECERRA
 Attorney General of California
 MICHAEL L. NEWMAN
 Supervising Deputy Attorney General
 JAMES F. ZAHRADKA II (SBN 196822)
 1515 Clay Street, 20th Floor
 P.O. Box 70550
 Oakland, CA 94612-0550
 Telephone: (510) 879-1247
 Email: James.Zahradka@doj.ca.gov
Attorneys for Plaintiff State of California

JOSEPH W. COTCHETT (SBN 36324)
 NANCY L. FINEMAN (SBN 124870)
 COTCHETT, PITRE & MCCARTHY, LLP
 San Francisco Airport Office Center
 840 Malcolm Road, Suite 200
 Burlingame, CA 94010
 Telephone: (650) 697-6000
 Facsimile: (650) 697-0577
 Email: nfineman@cpmlegal.com
Attorneys for Plaintiff City of San Jose

JONATHAN WEISSGLASS (SBN 185008)
 STACEY M. LEYTON (SBN 203827)
 ERIC P. BROWN (SBN 284245)
 ALTSHULER BERZON LLP
 177 Post Street, Suite 300
 San Francisco, CA 94108
 Telephone: (415) 421-7151
 Facsimile: (415) 362-8064
 Email: jweissglass@altber.com
*Attorneys for Plaintiffs County of Santa Clara and
 Service Employees International Union Local 521*

UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA
 SAN FRANCISCO DIVISION

THE REGENTS OF THE UNIVERSITY OF
 CALIFORNIA and JANET NAPOLITANO,
 in her official capacity as President of the
 University of California,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
 SECURITY and ELAINE DUKE, in her
 official capacity as Acting Secretary of the
 Department of Homeland Security,

Defendants.

CASE NO. 17-CV-05211-WHA

DECLARATION OF SHAWN BRICK

DECLARATION OF SHAWN BRICK

All DACA Cases (Nos. 17-5211, 17-5235, 17-5329, 17-5380, 17-5813)

1 STATE OF CALIFORNIA, STATE OF
2 MAINE, STATE OF MARYLAND, and
STATE OF MINNESOTA,

3 Plaintiffs,

4 v.

5 U.S. DEPARTMENT OF HOMELAND
6 SECURITY, ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
7 of Homeland Security, and the UNITED
STATES OF AMERICA,

8 Defendants.

CASE NO. 17-CV-05235-WHA

9 CITY OF SAN JOSE, a municipal corporation,

10 Plaintiffs,

11 v.

12 DONALD J. TRUMP, President of the United
13 States, in his official capacity, ELAINE C.
DUKE, in her official capacity, and the
14 UNITED STATES OF AMERICA,

15 Defendants.

CASE NO. 17-CV-05329-WHA

16 DULCE GARCIA, MIRIAM GONZALEZ
17 AVILA, SAUL JIMENEZ SUAREZ,
VIRIDIANA CHABOLLA MENDOZA,
18 NORMA RAMIREZ, and JIRAYUT
LATTHIVONGSKORN,

19 Plaintiffs,

20 v.

21 UNITED STATES OF AMERICA, DONALD
J. TRUMP, in his official capacity as President
22 of the United States, U.S. DEPARTMENT OF
HOMELAND SECURITY, and ELAINE
23 DUKE, in her official capacity as Acting
Secretary of Homeland Security,

24 Defendants.

CASE NO. 17-CV-05380-WHA

25
26
27
28

DECLARATION OF SHAWN BRICK

All DACA Cases (Nos. 17-5211, 17-5235, 17-5329, 17-5380, 17-5813)

COUNTY OF SANTA CLARA and
SERVICE EMPLOYEES INTERNATIONAL
UNION LOCAL 521,

Plaintiffs,

v.

DONALD J. TRUMP, in his official capacity
as President of the United States, JEFFERSON
BEAUREGARD SESSIONS, in his official
capacity as Attorney General of the United
States; ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security; and U.S.
DEPARTMENT OF HOMELAND
SECURITY,

Defendants.

CASE NO. 17-CV-05813-WHA

1 I, SHAWN BRICK, DECLARE:

2 1. I am the Associate Director for Student Financial Support at the University of California
3 Office of the President ("UCOP"). The matters set forth herein are true and correct of my own personal
4 knowledge and, if called as a witness, I could and would testify competently thereto.

5 I have held various positions in student financial aid and admissions in the University of California
6 ("UC") system for fifteen years and am currently the Associate Director for Student Financial Support at
7 the UCOP. As Associate Director for Student Financial Support, my duties include policy analysis,
8 development, and implementation. I am responsible for producing complex analyses, executive
9 summaries, and talking points on UC enrollment and affordability of UC education.

10 2. This declaration describes UC's population of undocumented students and students who
11 have Deferred Action for Childhood Arrivals status ("DACA students"), and the financial investment
12 UC has made in those students. It then explains the investment that UC expects undocumented and
13 DACA students (and their families) to make in their own education. It then provides figures on UC's
14 investment in graduate students. Finally, it provides the average debt of professional students upon
15 graduation from UC. The rescission of the DACA program puts at risk the financial investment that UC
16 and these students and families have made in their education.

17 3. UC's mission includes provision of public undergraduate, graduate, and professional
18 education. A key measure of our success is the percentage of entering students who complete their
19 degrees. DACA students have earned their positions in programs at UC through their academic merit
20 and accomplishments. UC invests in all its students, including DACA students, to enable them to
21 continue their programs, complete their degree(s), graduate and become contributing members of
22 society, including pursuing the careers for which UC trained them.

23 4. As described below, the University has provided financial support to its DACA and
24 undocumented students enrolled as of the 2016-2017 academic year in the cumulative amount of
25 between approximately \$87 million to \$252 million since 2013. The same students and their parents
26 would have to have invested approximately \$73 million to \$180 million over the same period.

27
28

UC's Undocumented and DACA Students

5. As of the 2016-2017 academic year, UC had approximately 4,200 potentially undocumented students, of which approximately 1,700 students are likely to be DACA recipients.

6. This assessment is based on an analysis of several criteria in our financial aid data that suggest students are undocumented, and additional criteria suggesting that they have DACA status. To approximate the 4,200 undocumented student population, I considered that undocumented students are not eligible for federal financial aid, but, if they are eligible for the California nonresident tuition exemption under California Assembly Bill 540 ("AB540") then undocumented students (and only undocumented students) may choose to file a California DREAM (Development, Relief, and Education for Alien Minors) financial aid application. For the 4,200 students who meet this criteria, I then applied additional criteria to approximate the subset of 1,700 students who appear to have DACA work authorization.

7. This approach is likely to underestimate the number of undocumented students and, therefore, the number of students with DACA status at UC. For example, this figure would not include students who do not or cannot submit a California DREAM Act application for various reasons, or for whom we cannot identify likely work authorization for various reasons. It also excludes many graduate and professional students because the same criteria cannot be applied to accurately identify these students.

UC and State Investment in DACA Students

8. Based on my assessments of undocumented and DACA student populations, I approximate UC's financial investment in these students cumulatively from 2013 to the 2016-2017 academic year, including state grants and other sources. UC awards financial aid to students on a non-discriminatory basis according to students' financial need, as they demonstrate that need by submitting a Free Application for Federal Student Aid ("FAFSA") (not applicable to undocumented students or DACA students, who are ineligible for federal aid) or a California DREAM Act application.

9. UC has invested cumulatively between \$87 million (based on the DACA only estimate of 1,700 students) and \$252 million (based on the 4,200 undocumented estimate) in the DACA students

1 who were pursuing degrees at UC as of the 2016-2017 academic year (based on dollar figures from
2 preliminary 2016-2017 data). This is the approximate, cumulative investment in the cohort of
3 undocumented and DACA students enrolled as of 2016-2017 at UC, over the course of their enrollment
4 at UC from 2013 to the 2016-2017 academic year. The estimates are from 2013 onward because this was
5 the earliest year that California DREAM Act data was received by UC, and it was this data that enabled
6 me to assess the populations of undocumented and DACA student populations as described above.

7
8 **UC Expectation of Student and Parent Investment in DACA Students' Education**

9 10. All students and their parents are expected to invest in paying for the student's college
10 education. UC's financial aid policy for undergraduates approaches paying for the total cost of
11 attendance (tuition, fees, living expenses, books and supplies) as a partnership between parents, students,
12 state and federal governments, and UC. Parents and students are expected to contribute based on their
13 resources as reported on either the FAFSA (not applicable to undocumented students or DACA students,
14 who are ineligible for federal aid) or the California DREAM Act application. UC then uses the same
15 formula for all students to determine financial aid, based on demonstrated financial need. The average
16 expected parent contribution for the 4,200 undocumented students was roughly \$700 per year, as
17 calculated using this same formula for all students, based on financial need.

18 11. UC also expects all students that are financial aid recipients to contribute "self-help"
19 amounts to their education through work or loans in the amount of \$10,000 per year. Many students
20 who have DACA work authorization hold jobs to satisfy this portion of their financial obligation.
21 Without DACA work authorization, it will be much more difficult for undocumented students to satisfy
22 the self-help contribution that UC expects of all students.

23 12. The combined expected family investment is therefore \$10,700 per year by students and
24 parents, or \$42,800 for a completion of a four-year undergraduate degree. For our DACA and
25 undocumented students, this totals between approximately \$73 million (based on the DACA-only
26 estimate of 1,700 students) and \$180 million (based on the 4,200 potentially undocumented estimate).

Average Investment Graduate Academic and Professional Students

13. Because financial aid often works differently in UC graduate and professional programs, I am unable to accurately estimate our population of undocumented or DACA graduate and professional students based on financial aid records. However, UC believes that there are enrolled graduate and professional students who are DACA students.

14. The University invests heavily in its graduate academic and professional students. In 2015-2016, UC paid \$523 million in University-funded fellowships to all of its graduate and professional students.

15. Graduate students are primarily supported through fellowships and employment as research and teaching assistants. In 2015-2016, UC's graduate academic students received an average combined fellowship and assistanceship award of more than \$37,000 per student per year, including any graduate DACA students.

16. By contrast, professional degree students primarily finance their degree by investing themselves through student loans. The UCOP tracks student loan borrowing patterns by professional students to estimate students' debt incurred for their own degrees. The average student loan debt for professional students is as follows, by program:

Average Professional Student Debt Upon Graduation

Degree Type	Cumulative Borrowing, 2015-2016 Graduating Cohort
Law	\$124,000
MBA	\$81,000
Medicine	\$154,000
Education	\$37,000
Other Health Professions	\$112,000
Other Non-Health	\$54,000

17. Without DACA, it will be difficult if not impossible for many of these graduate and professional students to complete their degrees and then to repay their significant debt from those degrees. Some of these degrees require work experience as a condition of graduation, such as a researcher or graduate student instructor. Further, without DACA, these students will lose the

1 employment authorization that enabled them to work in their chosen profession at a salary
2 commensurate with the debt incurred for their advanced degree.

3
4 **Conclusion**

5 18. As indicated above, this assessment of investments of UC and its students in their
6 education are conservative in many respects and the actual investment in undocumented and DACA
7 students is likely greater.

8 19. The rescission of DACA puts in jeopardy the cumulative financial investments in the
9 education of these talented students by the UC, the State of California, their families and the students
10 themselves, as well as the ability of students to repay the debt incurred to pursue their education.

11 I declare under penalty of perjury under the laws of the United States that the foregoing is true
12 and correct.

13 Executed on October 23, 2017 in Oakland, California.

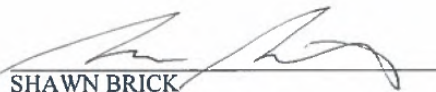
14
15
16 
17 SHAWN BRICK

EXHIBIT CC

JEFFREY M. DAVIDSON (SBN 248620)
 ALAN BERSIN (SBN 63874)
 COVINGTON & BURLING LLP
 One Front Street, 35th Floor
 San Francisco, CA 94111-5356
 Telephone: (415) 591-6000
 Facsimile: (415) 591-6091
 Email: jdavidson@cov.com,
 abersin@cov.com
*Attorneys for Plaintiffs The Regents of the
 University of California and Janet Napolitano, in
 her official capacity as President of the
 University of California*

THEODORE J. BOUTROUS, JR. (SBN 132099)
 ETHAN D. DETTMER (SBN 196046)
 JESSE S. GABRIEL (SBN 263137)
 GIBSON, DUNN & CRUTCHER LLP
 333 South Grand Avenue
 Los Angeles, CA 90071-3197
 Telephone: (213) 229-7000
 Facsimile: (213) 229-7520
 Email: tboutrous@gibsondunn.com,
 edettmer@gibsondunn.com,
 jgabriel@gibsondunn.com
*Attorneys for Plaintiffs Dulce Garcia, Miriam
 Gonzalez Avila, Saul Jimenez Suarez, Viridiana
 Chabolla Mendoza, Norma Ramirez, and Jirayut
 Latthivongskorn*

XAVIER BECERRA
 Attorney General of California
 MICHAEL L. NEWMAN
 Supervising Deputy Attorney General
 JAMES F. ZAHRADKA II (SBN 196822)
 1515 Clay Street, 20th Floor
 P.O. Box 70550
 Oakland, CA 94612-0550
 Telephone: (510) 879-1247
 Email: James.Zahradka@doj.ca.gov
Attorneys for Plaintiff State of California

JOSEPH W. COTCHETT (SBN 36324)
 NANCY L. FINEMAN (SBN 124870)
 COTCHETT, PITRE & MCCARTHY, LLP
 San Francisco Airport Office Center
 840 Malcolm Road, Suite 200
 Burlingame, CA 94010
 Telephone: (650) 697-6000
 Facsimile: (650) 697-0577
 Email: nfineman@cpmlegal.com
Attorneys for Plaintiff City of San Jose

JONATHAN WEISSGLASS (SBN 185008)
 STACEY M. LEYTON (SBN 203827)
 ERIC P. BROWN (SBN 284245)
 ALTSHULER BERZON LLP
 177 Post Street, Suite 300
 San Francisco, CA 94108
 Telephone: (415) 421-7151
 Facsimile: (415) 362-8064
 Email: jweissglass@altber.com
*Attorneys for Plaintiffs County of Santa Clara and
 Service Employees International Union Local 521*

**UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA
 SAN FRANCISCO DIVISION**

THE REGENTS OF THE UNIVERSITY OF
 CALIFORNIA and JANET NAPOLITANO,
 in her official capacity as President of the
 University of California,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
 SECURITY and ELAINE DUKE, in her
 official capacity as Acting Secretary of the
 Department of Homeland Security,

Defendants.

CASE NO. 17-CV-05211-WHA

**DECLARATION OF DR. ROBIN HOLMES-
 SULLIVAN**

STATE OF CALIFORNIA, STATE OF
MAINE, STATE OF MARYLAND, and
STATE OF MINNESOTA,

Plaintiffs,

v.

U.S. DEPARTMENT OF HOMELAND
SECURITY, ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security, and the UNITED
STATES OF AMERICA,

Defendants.

CASE NO. 17-CV-05235-WHA

CITY OF SAN JOSE, a municipal corporation,

Plaintiffs,

v.

DONALD J. TRUMP, President of the United
States, in his official capacity, ELAINE C.
DUKE, in her official capacity, and the
UNITED STATES OF AMERICA,

Defendants.

CASE NO. 17-CV-05329-WHA

DULCE GARCIA, MIRIAM GONZALEZ
AVILA, SAUL JIMENEZ SUAREZ,
VIRIDIANA CHABOLLA MENDOZA,
NORMA RAMIREZ, and JIRAYUT
LATTHIVONGSKORN,

Plaintiffs,

v.

UNITED STATES OF AMERICA, DONALD
J. TRUMP, in his official capacity as President
of the United States, U.S. DEPARTMENT OF
HOMELAND SECURITY, and ELAINE
DUKE, in her official capacity as Acting
Secretary of Homeland Security,

Defendants.

CASE NO. 17-CV-05380-WHA

COUNTY OF SANTA CLARA and
SERVICE EMPLOYEES INTERNATIONAL
UNION LOCAL 521,

Plaintiffs,

v.

DONALD J. TRUMP, in his official capacity
as President of the United States, JEFFERSON
BEAUREGARD SESSIONS, in his official
capacity as Attorney General of the United
States; ELAINE DUKE, in her official
capacity as Acting Secretary of the Department
of Homeland Security; and U.S.
DEPARTMENT OF HOMELAND
SECURITY,

Defendants.

CASE NO. 17-CV-05813-WHA

1 I, ROBIN HOLMES-SULLIVAN, DECLARE:

2 1. I am the Vice President for Student Affairs at the University of California ("UC"). The
3 matters set forth herein are true and correct of my own personal knowledge and, if called as a witness, I
4 could and would testify competently thereto.

5 2. In my role as Vice President, I oversee the overall student experience across UC's
6 campuses, and I work closely with the UC President and Provost in efforts to enhance the diversity,
7 experiences, and successes of UC students, especially undergraduate students. This includes not only
8 overseeing the UC undergraduate application process for admissions and financial support program, but
9 also monitoring diversity and campus climate, overseeing student mental health and wellness,
10 overseeing policies guiding student conduct, student activities, admissions and financial aid, and also
11 serving as an intermediary between UC campuses, UC Office of the President, and student
12 groups/leadership. In my role, I visit all UC campuses on a regular basis, where I meet and talk with
13 faculty, staff and students. My office provides overall guidance and support to a plethora of Presidential
14 Initiatives carried out on each of the campuses, including the President's Advisory Council on
15 Undocumented Students, Student Veterans, LGBT Students, Faculty and Staff, the Global Climate
16 Leadership Council, the California Community College Transfer Initiative, and the Global Food
17 Initiative, to name a few. I enjoy a close working relationship with different individuals across our
18 campuses, including student leaders and each Vice Chancellor of Student Affairs.

19 3. In my role, I have observed and heard firsthand about the abilities and experiences of
20 DACA students, as well as how the announced rescission of the DACA policy has affected them. UC
21 data shows that with the implementation of DACA in 2012, the first-year persistence rate (i.e., percent
22 of students continuing on to the second year) increased significantly for these students who could count
23 on receiving financial aid, and no longer feared deportation.

24 4. Our DACA students are very talented and make important contributions to the State of
25 California and the United States as a whole. From August 1, 2017 to August 20, 2017, Tom K. Wong of
26 the University of California, San Diego; United We Dream (UWD); the National Immigration Law
27 Center (NILC); and the Center for American Progress fielded a national survey to further analyze the
28 economic, employment, educational, and societal experiences of DACA recipients. This is the largest

1 study to date of DACA recipients with a sample size of 3,063 respondents in 46 states as well as the
2 District of Columbia. The data illustrate that DACA recipients continue to make positive and significant
3 contributions to the economy, including earning higher wages, which translates into higher tax revenue
4 and economic growth that benefits all Americans
5 ([https://www.americanprogress.org/issues/immigration/news/2017/08/28/437956/daca-recipients-](https://www.americanprogress.org/issues/immigration/news/2017/08/28/437956/daca-recipients-economic-educational-gains-continue-grow/)
6 [economic-educational-gains-continue-grow/](https://www.americanprogress.org/issues/immigration/news/2017/08/28/437956/daca-recipients-economic-educational-gains-continue-grow/)).

7 5. Additionally, our undocumented and DACA graduate students make amazing
8 contributions to medicine and technology, including through discoveries that have the potential to help
9 communities throughout California. For instance, one of our former DACA PhD students researched the
10 indicators for sudden cardiac death—the leading natural cause of death in Americans. This vital research
11 has the potential to save countless lives.

12 6. Due to their talent and chosen fields of study, DACA students serve as academic role
13 models to other students across UC's campuses. DACA students at all 10 of the campuses serve as
14 teaching assistants ("TAs"). There are, for instance, four DACA-recipient PhD students at UC Merced
15 who work as TAs. At UC Merced, 55 percent of the baccalaureate degrees awarded are in science,
16 technology, and math, and several of the DACA PhD students' focuses lie in those fields. The industries
17 that students and graduate students with science, technology, or math degrees enter are among the least
18 diverse sectors of the economy
19 (http://www.air.org/sites/default/files/downloads/report/AGEP_Lit_Review_10-26-09_0.pdf), and part
20 of both the University and UC Merced's mission to diversify historically non-diverse industries. Our
21 DACA-recipient TAs not only promise to diversify those fields upon entering the workforce, but they
22 also serve as inspiration to the diverse undergraduate students in their classes that careers in those fields
23 are attainable for them, too.

24 7. Our undocumented and DACA students' influence is not limited to the classroom. Many
25 serve as role models in the broader community. Some of our campuses are located in regions of the state
26 where a fair percentage of K-12 students are undocumented youth or members of the migrant farm
27 community. We have DACA-recipients who volunteer at these K-12 schools, showing local children
28 that a college education is attainable and worthwhile.

1 8. UC values diversity, and exposure to other perspectives is a critical part of a complete
2 education. Developing robust cultural competency requires exposure to different cultures and
3 viewpoints, and exposing others to the viewpoints of DACA recipients is an important component of
4 that. Indeed, our undocumented and DACA students are vital members of our community. We have
5 DACA students who serve as leaders of local chapters of national Greek Societies and in various student
6 clubs, are influential student leaders and serve in student government, and are heavily involved in
7 important events, such as performing the national anthem at school commencements. Through this
8 engagement—both in the classroom and around campus—DACA students interact with many people
9 and are able to share their unique perspectives with them. This enriches the social and educational
10 environment for all. The valuable cultural exchange would be impoverished if undocumented students—
11 including DACA recipients—were not on campus or were not as willing to share their stories and
12 perspectives.

13 9. DACA recipients are often model students on campus and are valuable to UC. Not only
14 do undocumented students perform very well academically, but also they are highly involved in other
15 aspects of student life and have few disciplinary issues. For example, at UC Santa Barbara, University
16 Service Awards are given each year to recognize the contributions and achievements of outstanding
17 graduating seniors and graduate students who have performed above and beyond the call of duty in
18 service to the University, the student body, and the community or have succeeded while facing
19 extraordinary challenges. For the 2016-17 year, several of the annual University Service Awards were
20 given to DACA recipients.

21 10. The announcement to rescind the DACA policy has created several harms. Our students
22 report stressors ranging from a fear of deportation, increased discrimination, and the possibility of being
23 unable to continue their studies. The most instantly recognizable impact for me—other than the various
24 psychological and emotional strains our DACA recipients report—is our current inability to provide our
25 students with the counseling resources they need.

26 11. I have spoken with DACA students who are afraid that they or their family members will
27 be detained or deported. One DACA student explained that she did not feel safe driving from campus to
28 her parents' house because doing so required passing through an immigration checkpoint. She is afraid

1 that immigration officers will learn her identity and follow her home or to campus. Not only is she
2 scared, but her fear is preventing her from visiting her family, a valuable support network for her. This is
3 not a unique story. This climate of fear has intensified since the announcement to rescind the DACA
4 policy.

5 12. We have observed an increase in anti-immigrant incidents on campus following the 2016
6 presidential election and the announcement to rescind DACA. On multiple occasions, racist posters
7 targeted at immigrants have been put up on campuses overnight. There have also been several incidents
8 where UC students are presumed to be immigrants and yelled at that they “do not belong” and that they
9 should “go home.” Our DACA students are afraid that they will be harassed or attacked because of their
10 immigration status or the fact that they “look like immigrants.”

11 13. The uncertainty of being able to pay for school is also a significant source of stress for
12 our students. Financial aid often covers part of the full tuition for DACA students, but students are
13 expected to pay for some of the cost—approximately \$10,000—out of their own pockets. Many DACA
14 recipients thus rely on their ability to work, pursuant to work authorization, to pay for this cost of
15 attendance. Beyond the need to support themselves, some DACA recipients work to provide for their
16 families. When this is the case, some DACA students view school as a lower priority than working to
17 earn as much as possible before their DACA status—and consequently their work authorization—ends.

18 14. One consequence of all these stressors is that DACA students are presently unable to
19 focus on their studies with the same intensity that they have in the past. I have heard from academic
20 counselors who have observed a dip in the academic performance of DACA recipients since the
21 rescission was announced. Professors are also concerned and report that many DACA students have
22 reached out to them to report difficulty studying, completing assignments or focusing on their school
23 work due to the stress they are experiencing. Our campus support staff have received a flood of emails
24 from faculty who are concerned for their DACA students and are unsure how best to support them. We
25 are working diligently to train our teachers about what resources exist and what they can do personally
26 to help our DACA students.

27 15. The stress caused by rescission of the DACA policy has resulted in a dramatic increase in
28 the number of requests from DACA students for mental health services. For example, at UC Merced,

1 over the weeks following the announcement to rescind DACA, demand for counseling services more
2 than doubled from 11% of the total student population to 23% of the student population. At UC
3 Berkeley, the number of appointments and walk-ins for mental health counseling increased by 90%
4 following the announcement.

5 16. I have also heard from my staff and from DACA students themselves that we need
6 psychologists and other experts who are familiar with the challenges faced by undocumented
7 individuals. Again, we are devoting time and rerouting resources to address this. Doing so undoubtedly
8 places more demands on these services by the campus community as a whole. On some campuses we
9 have increased the number of full-time staff members and hired more peer counselors to staff our mental
10 health facilities. We have also reached out to our local contacts and brought in attorneys to run “know
11 your rights” workshops. We have also invested time and money into our UndocuAlly training program,
12 through which we teach our counselors and some of our faculty about what it means to be
13 undocumented in this country. This better prepares our staff to provide our DACA students the services
14 they need.

15 17. Our staff is working tirelessly to address the acute demand for services following the
16 announcement to rescind the DACA policy. I have observed the increased hours and emotional toll that
17 this has had on our staff as they try to provide DACA students with information and support, and I am
18 concerned that staff members will burn out and seek employment elsewhere.

19 18. I and some of my colleagues are also concerned that the uncertainty surrounding the
20 DACA policy will result in a loss of current and future students. For example, I have heard that two
21 undergraduate students at UCLA called to cancel their enrollment after DACA’s rescission was
22 announced. I have heard from several Vice Chancellors who are preparing for the possibility that DACA
23 students will leave on an upcoming break from classes and will not return to school. Some of these
24 students may decide not to return due to a desire to work and support their families while they can or to
25 minimize the student debt they accrue before their DACA status expires. For others, though, the choice
26 is out of their hands. Some families are deciding to leave the country and are taking their children with
27 them. Still others depend on their DACA status for basic necessities. We have at least one DACA
28 student who serves as a resident advisor, a position that comes with room and board but requires work

1 authorization. If this student loses their work authorization—which they will when their DACA status
2 expires—they will lose their home.

3 19. Our PhD students and others will not be able to continue as TAs without work
4 authorization. Being a TA is a full-year commitment, and part of a TA's compensation is graduate
5 school tuition reduction. When these students lose DACA status, they can no longer be employed as
6 TAs, and their tuition will be higher, directly impacting their ability to pay for graduate school. UC will
7 also have to scramble to find replacement TAs to take over teaching responsibilities mid-term. This, like
8 our other efforts, will require time, energy, and money on UC's part. But beyond the administrative
9 costs, losing our DACA TAs also deprives us of their impact as role models to diverse undergraduates
10 who might be considering advanced degrees in historically non-diverse fields. Accordingly, if we lose
11 these diverse PhD candidates, then our commitment to diversifying these fields is harmed.

12 20. I, my staff, and the high school counselors we interact with are all concerned about a
13 possible decrease in the number of undocumented applicants to UC as a result of the uncertainty created
14 by the rescission of DACA. High school students are concerned about whether they will be accepted by
15 their peers and the institution. They are also worried about the financial burden. As discussed, UC
16 students need to cover some of the cost of attendance, and high school students are worried that, without
17 work authorization, they will be unable to support themselves through school.

18 21. We are trying to respond to the possible loss of both current and future students by
19 creating focused communication campaigns. Currently, we are ramping up our efforts to convince our
20 current students that they belong here and that we are doing all we can to provide them the institutional
21 support they need. One of our staff members is spending time writing and sending out weekly updates
22 discussing DACA-related news and campus resources. Vice Chancellors are spending time personally
23 reaching out to donors, trying to raise money that we can provide to undocumented students and DACA-
24 recipients as stipends or grants.

25 22. In addition to diverting money, we are also spending time and energy making sure that
26 qualified high school students who would normally apply to UC still do so this year. We have hosted
27 outreach conferences around the state in order to provide information to address the current confusion
28 and concern that exists among high school counselors and their students. Nevertheless, the fear and

1 uncertainty looms large and, according to our outreach counselors, is having a negative impact on the
2 recruitment of students who have DACA, despite our positive messages.

3 23. We are also trying to secure replacement housing for the DACA RA who faces the
4 looming threat of losing their home. Thus, we are rapidly diverting resources to address these serious,
5 imminent harms.

6 24. We are not the only institution that has recognized these pending harms, but we are
7 quickly deploying our resources to address them. Other educational institutions like local community
8 colleges and high schools are concerned about the same issues and have reached out to us for help and
9 advice creating their own resources or borrowing from our approach.

10 25. UC recognizes that the institution and broader community are harmed if we lose current
11 students and qualified future students. By losing our undergraduate and graduate DACA students and by
12 missing out on qualified students who would otherwise attend, we are losing inspiring individuals who
13 have served as role models to various kinds of students, brilliant minds, and a source of diversity that is
14 important to building cultural competency and diversifying traditionally non-diverse professions.

15 I declare under penalty of perjury under the laws of the United States that the foregoing is true
16 and correct.

17 Executed on October 24, 2017 in Oakland, California.

18
19
20
21
22
23
24
25
26
27
28


DR. ROBIN HOLMES-SULLIVAN

EXHIBIT 37

**AMERICAN FARM BUREAU FEDERATION®**

600 Maryland Ave. SW | Suite 1000W | Washington, DC 20024

ph. 202.406.3600

f. 202.406.3602

www.fb.org

AGRICULTURAL LABOR – IMMIGRATION REFORM

Issue:

U.S. agriculture faces a critical shortage of workers every year, as citizens are largely unwilling to engage in these rigorous activities and guestworker programs are unable to respond to the marketplace. This situation makes our farms and ranches less competitive with foreign farmers and less reliable for the American consumer. Securing a reliable and competent workforce for our nation's farms and ranches is essential to agriculture and the U.S. economy.

Background:

Farmers and ranchers have long experienced difficulty in obtaining workers who are willing and able to work on farms and in fields. Jobs in agriculture are physically demanding, conducted in all seasons and are often transitory. To most U.S. residents seeking employment, these conditions are not attractive. A number of studies document this fact, and farm worker representatives also acknowledged this in recent congressional testimony. Yet, for many prospective workers from other countries, these jobs present real economic opportunities.

In times of labor shortages farmers have relied on these foreign workers, who are admitted under a government sponsored temporary worker program known as H-2A, and on workers who appear to have legal status to be working in the United States. The demand for foreign workers is heightened due to not only a lack of a domestic workforce, but also the reverse migration of workers from the U.S. to Mexico, historic levels of immigration enforcement and bipartisan congressional commitment to a credible work authorization system through mandatory E-Verify. Those factors, combined with an increasingly rigid and burdensome H-2A program, demonstrate the need for a new approach.

Reforms to the immigration system can assure that American agriculture has a legal, stable supply of workers, both in the short- and long-term for all types of agriculture. This requires a legislative solution that deals with the current unauthorized and experienced agricultural workforce and ensures that future needs are met through a program that will admit a sufficient number of willing and able workers in a timely manner. Past legislative proposals (e.g. AgJOBS, HARVEST Act, BARN Act and other bills) have attempted to reform the H-2A program to ensure a future workforce in agriculture. However, it is apparent that those proposals are no longer viable to meet agriculture's needs.

Multiple H-2A regulatory changes and rigid program administration have made use of an already difficult program nearly impossible. A national survey conducted by the National Council of Agricultural Employers of H-2A employers under the current rules showed that administrative delays result in workers arriving on average 22 days after the date of need causing an economic loss of nearly \$320 million for farms that hire H-2A workers. Costly recruitment requirements result in less than 5 percent of those referred by the government working the entire contract period.

Agriculture needs a program that functions as efficiently as the current free market movement of migrant farm workers while providing the security of a contractual relationship in areas where there is little migration. Having lost confidence in the H-2A structure as a framework for future success, Farm Bureau is seeking the new approach outlined above to ensure a legal, reliable, long-term workforce for all sectors of the industry.

Legislative Status:

In Nov. 2014, the President announced his plans to take executive action on immigration reform. The Executive Order contains 3 critical elements: (1) Cracking Down on Illegal Immigration at the Border, (2) Deporting Felons, Not Families and (3) Creation of Deferred Action for Parents of Americans and Lawful Permanent Residents (DAPA) where undocumented immigrants who have lived in the U.S. for more than five years and are parents of U.S. citizens or Lawful Permanent Residents can register and temporarily stay in the U.S. without fear of deportation for three years at a time. On June 23, 2016 the United States Supreme Court divided 4-4, leaving in place the lower court decision forbidding the president from launching DAPA and raising question about the validity of DACA. The other components of the executive actions continue to be in effect.

AFBF continues to advocate to Congress to pass responsible legislative immigration reform that addresses border security, fixes the legal immigration system and provides farmers access to a legal and stable workforce. Due to the presidential election cycle, AFBF does not expect Congress to take up true ag labor reform; therefore, we are focusing on reforming the H-2A program through the appropriations process.

AFBF Policy:

Only reform through legislation can solve the agricultural worker problem. In seeking a meaningful legislative solution to agriculture's worker shortage, AFBF believes that immigration reform must include the following:

Agricultural Worker Program

The uncapped Agricultural Worker Visa Program (AWP) will ensure agriculture's future legal workforce. The AWP allows both employer and employee choice and flexibility by including two options:

1. "At-Will" Visa employees have the freedom to move from employer to employer without any contractual commitment, replicating the way market forces allocate the labor force now.
2. Contract Visa employees commit to work for an employer for a fixed period of time, giving both parties increased stability where it is mutually preferred.

Current Workforce

In order to minimize the impact on current economic activity, AFBF supports an adjustment of status for experienced but unauthorized agricultural workers who currently reside in the U.S. This adjustment should include the following components:

1. These workers have a future obligation to work for a number of days annually in agriculture for several years.
2. Upon completion of this future work obligation, the workers could obtain permanent legal status and the right to work in whatever industries they choose, including agriculture.

Contact: Kristi Boswell, 202-406-3675, kristib@fb.org

October 2016